

## POSTER PRESENTATIONS

## Track 1: From Cells to Whole Body Physiology

## ISC Abstract Selected Posters

## T1:PS.01

**The results of a 56 days high fat overfeeding study. Why do overweight subjects gain more weight than lean subjects?**Aron-Wisniewsky J<sup>1</sup>, Beltran S<sup>1</sup>, Oliel M<sup>1</sup>, S Monique<sup>1</sup>,  
Nazzare J-A<sup>1</sup>, Aligier M<sup>1</sup>, Bonnet F<sup>1</sup>, Pilleul F<sup>2</sup>, Scoazec J-Y<sup>3</sup>, L Martine<sup>1</sup><sup>1</sup>Centre De Recherche En Nutrition Humaine LYON; <sup>2</sup>Service de radiologie digestive de l'hôpital Edouard Herriot; <sup>3</sup>Service de cytologie et d'anatomie pathologique de l'hôpital Edouard Herriot

Although obesity incidence increases, people are not equal towards weight gain. Our aim was to study body weight change after a hypercaloric high fat diet in lean and overweight people.

7 lean men (BMI=22.7 kg/m<sup>2</sup>, aged 25.2years) and 6 overweight men (BMI=26.7 kg/m<sup>2</sup>, aged 42.6years) received for 56 days, in addition to their usual diet, 760 kcal/day (79% fat). On day 0, 14 and 56, blood samples were taken and resting metabolic rate and substrate oxidation were measured by indirect calorimetry. On day 0 and 56, body composition was assessed by DEXA, visceral and subcutaneous fat by abdominal MRI and physical activity by actigraph. Insulin sensitivity was measured by Euglycemic-hyperinsulinemic clamp (40mU/m<sup>2</sup>/mn).

**Results:** no difference in insulin sensitivity was seen after overfeeding. Weight gain was significantly higher in overweight group, even after age adjustment (3.7kg vs. 1.16kg p=0.04). Abdominal fat was stored in subcutaneous adipose tissue for overweight subjects and in visceral fat for lean subjects (Delta visceral fat=-2.5cm<sup>3</sup> vs. +19cm<sup>3</sup> p=0.05; Delta subcutaneous fat=+44cm<sup>3</sup> vs. -14cm<sup>3</sup> p=0.05).

We found a negative correlation between FFA and BMI, and in the overweight group only, an early lipolysis inhibition (FFA D0=415 vs. FFAD14=306 mmol/l p=0.04) associated with triglycerides rise (TGD0=1075 vs. TGD14=1473 mmol/l p=0.03) and insulin rise (InsD0=8.6 vs. InsD14=13.7mU/l p=0.03). Fat oxidation was lower at day 14 (OxLD0=0.86 vs. OxLD14=0.7mg/kg/mn). None of these results were found in the lean group.

**Conclusions:** Overweight subjects show higher susceptibility to weight gain than lean subjects due to early lipolysis inhibition and fat oxidation decrease.

## T1:PS.03

**Caloric restriction in non-obese people may reverse the age-induced impairment of the somatotrophic axis**Redman LM<sup>1</sup>, Veldhuis JD<sup>2</sup>, Rood J<sup>1</sup>, Ravussin E<sup>1</sup> and Smith SR<sup>1</sup> for the Pennington CALERIE Team.<sup>1</sup>Pennington Biomedical Research Center, Baton Rouge, LA.<sup>2</sup>Department of Internal Medicine, Mayo Clinic, Rochester, MN.

Human aging is marked by a reduction in both GH and IGF-1 concentrations owing to a reduced GH secretion but no alteration in secretion frequency and half life. Calorie restriction (CR) in rodents extends lifespan and restores a youthful growth hormone (GH) secretory pattern.

**Aim:** To evaluate the effect of different types of CR for 6 months on 11h GH secretory dynamics.

**Methods:** Forty-three (36.8±1.0y) overweight (BMI 27.8±0.7) men and women were randomized to either; Control=100% of energy requirements; CR=25% restriction; CR+EX=12.5% CR +12.5% increase in energy expenditure by exercise; LCD=low calorie diet until 15% weight reduction followed by weight maintenance. At baseline and month 6 we assessed changes in body composition (DXA), abdominal visceral fat (CT) and GH secretory dynamics (11-h of 10-min blood sampling).

**Results:** Weight change at 6 months was (CR: -10±1%, CR+EX:-10±1%, LCD:-14±1%). There were significant reductions in total fat mass (CR:-24±3%, CR+EX:-25±3%, LCD: -31±2%) and abdominal visceral fat (CR:-28±4%, CR+EX:-27±3%, LCD:-36±2%) in the 3 intervention groups. Mean 11h GH concentrations were not changed in CR or control but increased by 41±8% in CR+EX (p<.0001) and 53±8% in LCD (p<.0001) at month 6 owing to both increased secretory burst mass (CR+EX: 34±13%, LCD: 27±22%, p<.05) and amplitude (CR+EX: 34±14%, LCD: 30±20%, p<.05) but not to changes in burst frequency, inter-burst interval or GH half-life. Fasting ghrelin concentrations were significantly increased from baseline in all intervention groups however total IGF-1 concentrations were increased only in CR+EX (10±7%, p<.05) and LCD (19±4%, p<.001).

**Conclusion:** Short-term CR in humans can modify growth hormone secretion in a manner that is opposite to the changes reported with aging.

## T1:PS.02

**Differential expression of metabolic-related genes in male and female rats in response to a high-fat diet**

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The aim of this work was to determine the sex-associated differences in the expression of genes related with fuel uptake and utilization in different organs (white adipose tissue, muscle and liver) of rats in response to a high-fat (HF) diet.

For this purpose, male and female Wistar rats were fed for 6 months with a normal-fat (NF) or an HF-diet. Body weight, blood metabolites, and the expression of genes involved in the fuel metabolism and partitioning in white adipose tissue (WAT), skeletal muscle and liver were measured.

Female rats fed with HF-diet showed increased expression of genes related with energy influx in WAT (GLUT4, CD36, LPL) and with lipid utilization in muscle (PPAR-alpha, CPT1M). In contrast, male but not female rats showed increased hepatic PPAR-alpha and CPT1L mRNA expression, suggesting enhanced lipid handling and oxidation by this organ, and had higher triacylglycerol content in liver.

These results show sex-dependent differences in fuel uptake and utilization between tissues in response to an HF-diet, with a higher capacity of females to store fat in adipose tissue and to oxidize fatty acids in muscle. These adaptations can help to explain the lower tendency of females of suffering from obesity-linked disorders under conditions of HF-diet consumption.

## T1:PS.04

**Effects of trans-10,cis-12 conjugated linoleic acid on the expression of uncoupling proteins in hamsters fed an atherogenic diet**Ribot J<sup>1</sup>, Portillo MP<sup>2</sup>, Picó C<sup>1</sup>, Macarulla MT<sup>2</sup>, Andreu P<sup>1</sup><sup>1</sup>Laboratory of Molecular Biology, Nutrition and Biotechnology (Nutrigenomics), University of the Balearic Islands (UIB), Palma de Mallorca; and CIBER Fisiopatología Obesidad y Nutrición (CB06/03), Instituto de Salud Carlos III, Spain.<sup>2</sup>Department of Nutrition and Food Science, University of País Vasco, Vitoria, Spain.

Conjugated linoleic acid (CLA) feeding decreases body adiposity but the mechanisms involved are not clear.

The aim of this study was to analyse whether alterations in uncoupling protein (UCP) expression in white and brown adipose tissues (WAT and BAT, respectively) and in skeletal muscle may be responsible for the effect of trans-10,cis-12 CLA on the size of body fat depots in hamsters.

Animals were divided into three groups and fed an atherogenic diet with different amounts of trans-10,cis-12 CLA (0 control, 0.5, or 1 g/100 g diet) for 6 weeks.

CLA feeding reduced adipose depot weights, but it had no effect on body weight. Leptin mRNA expression decreased in both subcutaneous and perirenal WAT depots, in accordance with lower adiposity, whereas resistin mRNA expression was not changed. Animals fed CLA had lower UCP1 mRNA levels in BAT (both doses of CLA) and in perirenal WAT (low dose), and lower UCP3 mRNA levels in subcutaneous WAT (high dose). UCP2 mRNA expression in WAT was not significantly affected by CLA feeding. Animals fed the high dose of CLA showed increased UCP3 and carnitine palmitoyl transferase-I (CPT-I) mRNA expression levels in skeletal muscle.

In summary, induction of UCP1 or UCP2 in WAT and BAT is not likely to be responsible for the fat-reduction action of CLA, but the increased expression of UCP3 in skeletal muscle, together with a higher expression of CPT-I, may explain the reported effects of dietary CLA in lowering adiposity and increasing fatty acid oxidation by skeletal muscle.

## T1:PS.05

**Hyperleptinemia is a possible contributor to an attenuated fasting-induced activation of hypothalamic arcuate neurons in obese mice**

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The hypothalamic arcuate nucleus (ARC) functions as a target site for the lipostatic hormone leptin and the orexigenic hormone ghrelin. In mice, neuronal activity of ARC neurons correlates with the feeding status. c-Fos expression, a marker of neuronal activation, is high in orexigenic ARC neurons in the fasted state and refeeding reverses this activation. Using different models of obesity (late onset and diet-induced obesity, leptin deficient ob/ob mice) we analyzed whether obese animals show altered neuronal responses to fasting. Furthermore, by blocking ghrelin signaling and by repeated leptin treatment during fasting in lean mice, we determined whether changes in these hormones may play a role for ARC activation during fasting. Interestingly, in hyperleptinemic late onset and diet-induced obese mice the ARC was not activated during food deprivation. In contrast, leptin deficient obese mice (ob/ob) showed an exaggerated c-Fos response when fasted. Furthermore, leptin treatment of lean mice during food deprivation reduced the c-Fos response in the ARC. Blocking endogenous ghrelin by a long-acting antagonist (NOX-B1-3) in fasted mice did not prevent c-Fos expression in the ARC but potentially blocked the effect of exogenous ghrelin. We conclude that an increase in ghrelin levels does not appear to be a necessary for an activation of the ARC under our fasting conditions. The attenuation of fasting-induced ARC activation by leptin treatment or in obese mice with elevated leptin levels suggests that hyperleptinemia impairs the receptive function of ARC neurons to signals reflecting the status of energy intake.

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## T1:PS.07

**Is resveratrol a dietary compound which helps to prevent obesity?**

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Resveratrol (RSV; 3,5,4'-trihydroxystilbene) is a polyphenol present in many plant species and evincing estrogenic activity. The richest source of this compound is *Polygonum cuspidatum* and grapes. The interest of RSV has been increased for more than ten years and, during this time, RSV was found to exert numerous beneficial effects including the protection against cardiovascular disease, anticancer properties, inhibition of free radical generation. RSV is able to inhibit insulin secretion and to increase insulin sensitivity. Moreover, RSV appeared to be a modulator of lipid and lipoprotein metabolism, an important regulator of energy balance and a dietary compound reducing metabolic disturbances induced by a high-calorie diet, suggesting its anti-obesity properties. However, the direct influence of RSV on adipocyte functions is unknown.

The aim of the experiments was to investigate the effects of RSV on lipolysis and on the antilipolytic action of insulin in rat adipocytes. Cells, isolated from epididymal fat tissue of male Wistar rats, were incubated for 90 minutes with 100  $\mu$ M RSV and lipolytic factors - epinephrine (0.06, 0.125, 0.25, 0.5  $\mu$ M) or dibutyryl-cAMP (a direct activator of PKA; 0.06, 0.125, 0.25, 0.5 mM). The lipolysis was evaluated by the measuring of the amount of glycerol released to the incubation buffer. RSV significantly enhanced epinephrine-stimulated lipolysis, but did not change lipolysis induced by dibutyryl-cAMP. In the further studies, isolated adipocytes were incubated with epinephrine (0.5  $\mu$ M) in the presence of insulin (10 nM) and RSV (1, 10 and 100  $\mu$ M). It was found that the inhibitory action of insulin on epinephrine-induced lipolysis was attenuated by RSV. Similar effect was demonstrated in adipocytes exposed to epinephrine and H-89 (a direct activator of PKA; 50  $\mu$ M) - the antilipolytic action of H-89 was diminished in the presence of RSV (1, 10 and 100  $\mu$ M).

The stimulation of epinephrine-induced lipolysis and the attenuation of the antilipolytic action of insulin in adipocytes exposed to RSV seems to be independent on the estrogenic properties of the tested compound since these effects were not alleviated by blockade of intracellular estrogen receptors. Results obtained in the present study revealed for the first time that short-term exposure to RSV enhances adipocyte lipolysis and thereby contributes to reduced lipid accumulation in these cells.

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## T1:PS.06

**Prevalence, inheritance and clinical characteristics of MC4R deficiency in a study of 5,675 European children and adults**Stutzmann, F<sup>1</sup>, Tan K<sup>2</sup>, Balkau, B<sup>3</sup>, Potoczna, N<sup>4</sup>, Horber F<sup>1</sup>, O'Rahilly, S<sup>2</sup>, Farooqi, IS<sup>2\*</sup>, Meyre, D<sup>1,5</sup>, Froguel, P<sup>1,5</sup><sup>1</sup> CNRS-8090-Institute of Biology, Pasteur Institute, Lille, France<sup>2</sup> University of Cambridge Metabolic Research Laboratories, Institute of Metabolic Science, Addenbrooke's Hospital, Cambridge CB2 0QQ, UK<sup>3</sup> INSERM U780-IFR69, University Paris Sud, Villejuif, France<sup>4</sup> Klinik Lindberg, Winterthur, Switzerland<sup>5</sup> Department of Genomic Medicine, Hammersmith Hospital, Imperial College London, London, UK

Melanocortin-4 receptor (MC4R) deficiency is the commonest monogenic cause of obesity. However, studies have reported prevalence varying from 1 to 12; penetrance remains elusive with non-obese carriers reported recently and clinical expression variation along the life is also uncertain. We provide a comprehensive molecular and phenotypic characterization of MC4R-induced obesity in a large European population.

We sequenced the gene in 2,856 obese individuals and 2,677 non-obese controls and in the families of the mutation carriers. Newly identified missense mutations were functionally characterized. We also provided obesity-related phenotypes, including questionnaire-based appetitive behaviour.

Forty-three obese probands (1.46%) and four non-obese controls (0.15%) carried *MC4R* pathogenic mutations; familial penetrance was 60% for heterozygotes. The longitudinal study of relatives with available data evidenced an age-dependent penetrance (21% at 20years vs. 60% at >40yrs) suggesting *MC4R*-deficiency as a late-onset obesity disorder. Comparing the 97 carriers with their 81 WT relatives, we observed that the risk of obesity decreased across generations: it is multiplied by 3.4 for children carriers and by 1.7 for adults >52yrs ( $p=9.6 \cdot 10^{-3}$ ) but the risk to become obese after 52 when carrying a pathogenic mutation remains significant ( $p=10^{-11}$ ).

In conclusion, our report highlights the importance of genetic diagnosis, particularly for familial background of obesity. Young *MC4R*-deficient children should benefit an early and very specific follow-up. Indeed, the carriers of the coming generation have a high risk to become obese during childhood but non-penetrant children can not be assured to remain non-obese all along their life; prevention and care should be constant.

## T1:PS.08

**Epicardial fat thickness: relationship with plasma visfatin and plasminogen activator inhibitor-1 levels in women with morbid obesity**Malavazos AE<sup>1</sup>, Ermetici F<sup>1</sup>, Cereda E<sup>1</sup>, Coman C<sup>2</sup>, Morricone L<sup>1</sup>, Corsi M<sup>3</sup>, Ambrosi B<sup>1</sup><sup>1</sup>Endocrinology Unit, Department of Medical and Surgical Sciences, University of Milan, IRCCS Policlinico San Donato, Italy; <sup>2</sup>Echocardiographic Unit, IRCCS Policlinico San Donato, Italy; <sup>3</sup>Institute of General Pathology, University of Milan, Italy.

**Introduction:** Epicardial fat (EF), a true visceral adipose tissue (VAT) deposited around the heart, is a possible cardiovascular risk indicator, in view of its ability to produce and release several inflammatory adipo-cytokines. It is unknown whether increased cardiac adiposity is related to increased inflammatory adipo-cytokines in obesity. In this study we evaluated the possible relation between the echocardiographic EF thickness, an indicator of cardiac adiposity, and the levels of inflammatory adipo-cytokines such as visfatin and plasminogen activator inhibitor-1 (PAI-1) in visceral obesity.

**Methods:** EF thickness (by echocardiography), visfatin, PAI-1 antigen and other inflammatory markers were studied in 27 severely obese women (OB) (BMI 43.5±4.8 kg/m<sup>2</sup>) but without any apparent complications, and in 15 normal-weight controls. Abdominal VAT was assessed by CT.

**Results:** OB women had thicker EF and higher visfatin and PAI-1 antigen concentrations than controls (27.49±9.8 vs. 12.98±4.3 ng/mL and 96.16±21.7 vs. 28.34±15.2 ng/mL;  $p<0.0001$ ). The EF thickness, log-visfatin and log-PAI-1 antigen concentrations directly correlated with VAT ( $p<0.0001$ ). Log-visfatin and log-PAI-1 antigen correlated with EF thickness even after adjusting for indices of fat distribution ( $p<0.01$  and  $p<0.001$  respectively). When dividing OB on the basis of median EF thickness, women with greater EF thickness showed a greater VAT and higher adipo-cytokine and inflammatory markers concentrations.

**Conclusions:** a) EF thickness, an indicator of cardiac adiposity, is significantly related to inflammatory adipo-cytokines in visceral obese patients; b) it is suggested that EF may be used as an easy and reliable marker of visceral adiposity and inflammation and as a cardiovascular risk indicator.

## T1:PS.09

**Serum Amyloid A: relationships with characteristics of adipose tissue in different human fat depots.**

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Adipose tissue of obese subjects is characterised by macrophage infiltration and modifications of gene expression and secretory profiles. Previously we have shown that serum amyloid A (SAA) is produced by the adipocytes of obese patients. The role of which has not yet been established in adipose tissue. However, we hypothesised that SAA could be linked to pathological characteristics of adipose tissue in obese subjects.

We have studied the gene and protein expression profiles of SAA in 37 obese subjects (BMI= 49.3±1.5 kg/m<sup>2</sup>) in the superficial subcutaneous (SSAT), deep subcutaneous (DSAT) and the omental (OAT) adipose tissues. We analysed the relationship between the percentage of macrophages and the co-expressed genes in order to identify the functional groups of genes co-regulated with SAA.

The percentage of adipocytes expressing SAA is greater in the SSAT (11±1, vs 8±1 and 6±1) than in the DSAT or OAT. Furthermore, it is significantly correlated to adipocyte size. In the SSAT, this percentage was found to be 2.4% in small adipocytes (<60 µm) and 9.4% in hypertrophic adipocytes (>90µm). It is also correlated with the percentage of macrophages (R=0.5, p=0.0009). Microarray analyses have shown that the cholesterol efflux transporter ABCA1 is coexpressed with the SAA gene. In a subgroup of 20 subjects, we found a correlation between the ABCA1 and SAA protein expression (R=0.7, p=0.0003).

This work suggests a tissue specific role of SAA in the SSAT, especially in the hypertrophic adipocytes, where it may play a role in the efflux of cholesterol.

## T1:PS.11

**Molecular aspects of insulin resistance, cell signalling pathways and breast cancer in relation to obesity**

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A growing number of clinical studies validate a relation of insulin resistance and breast cancer in obese patients. We hypothesised that high plasma insulin levels cause aberrant insulin signalling in breast epithelial cells which may be responsible for an increase in cell proliferation, indicative of potential carcinogenesis and increased cancer progression. It was of particular interest to determine any differences of high insulin concentrations in activating the phosphoinositide-3 kinase (PI-3 kinase) pathway or the mitogen-activated protein kinase (MAP kinase) pathway, the latter being linked to increased cell proliferation.

We used two cell line models to investigate the carcinogenic (MCF-10A, immortalised breast epithelial cells) and cancer progression (MDA-MB-231, ER-negative breast cancer cells) potential of insulin. Insulin treatment (100 nM, 24 h) increased cell proliferation in MCF-10A cells, but had no cell proliferative effect on MDA-MB-231 cells. Additionally expression of PCNA as marker of proliferation was tested. The use of PI-3 kinase and MAP kinase specific inhibitors (Wortmannin and PD98059, respectively) demonstrated both pathways being responsible for the observed increase in cell proliferation (MCF-10A). Simultaneous treatment with both inhibitors eliminated insulin induced cell proliferation entirely. Phosphorylation of ERK1/2 was examined as specific activity measurement of MAP kinase pathway. Insulin induced higher phosphorylation levels in MCF-10A cells than in MDA-MB-231.

These preliminary results suggest that insulin may initiate carcinogenesis of breast epithelial cells by increasing cell proliferation rather than increasing cancer progression of existing tumours. These effects may be mediated by insulin activating both the PI-3 kinase and the MAP kinase signalling pathways.

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## T1:PS.10

**Dysregulated adiponectin signaling in insulin-sensitive tissues of spontaneously hypertensive rats**

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Adiponectin improves insulin sensitivity by reducing lipid accumulation in insulin-sensitive tissues through the activation of AMP-activated protein kinase (AMPK) and the subsequent deactivation of acetyl-CoA carboxylase (ACC). The aim of the present study was to analyse adiponectinemia and adiponectin signalling in insulin-sensitive tissues of hypertensive rats. Adiponectin, adiponectin receptors (AdipoR1 and AdipoR2) as well as enzymes involved in fatty acid oxidation (AMPK, ACC and CPT-1) were analysed by real time PCR and Western-blot in liver and gastrocnemius skeletal muscle of 10-12-week-old male normotensive Wistar rats and spontaneously hypertensive rats (SHR). Intrahepatic and intramyocellular triglyceride content was evaluated by enzymatic methods. SHR showed overweight, insulin-resistance, dyslipidaemia and increased circulating adiponectin concentrations. Increased mRNA and protein expression ( $P<0.05$ ) of adiponectin was observed in epididymal and subcutaneous adipose tissues. AdipoR1 and AdipoR2 mRNA and protein expression were not changed in liver, but the expression of adiponectin receptors was increased ( $P<0.01$ ) in skeletal muscle. Despite the hyperadiponectinemia, AMPK phosphorylation/activation in Thr<sup>286</sup> was not modified in liver and skeletal muscle. In addition, ACC phosphorylation/deactivation in Ser<sup>79</sup> was reduced ( $P<0.05$ ) and a subsequent increase ( $P<0.05$ ) in intrahepatic and intramyocellular lipid accumulation was observed. Interestingly, an increase in CPT1b expression was shown in skeletal muscle. In summary, the impaired adiponectin signalling via AMPK-ACC-CPT1 favors the lipid accumulation in liver and skeletal muscle. The overexpression of adiponectin in the adipose tissue and adiponectin receptors and CPT1b in the skeletal muscle might constitute a defective compensatory mechanism to overcome the adiponectin resistance observed in hypertensive rats.

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## T1:PS.12

**Adipocyte fatty acid-binding protein (A-FABP) is closely associated with obesity and insulin resistance in children**

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**Background:** Adipocyte-specific fatty acid-binding protein (A-FABP) is a predominant cytosolic protein of mature adipocytes. This protein may be an important regulator of systemic insulin sensitivity and lipid and glucose metabolism. We investigated the associations between A-FABP and obesity and insulin resistance in children.

**Methods:** We recruited 161 nine-year old children (80 males and 81 females) who voluntarily participated in this study. We measured weight, height, waist circumference, and blood pressures. Fasting plasma glucose, total cholesterol, triglyceride, and HDL-cholesterol were analyzed using autoanalyzer. Insulin was measured by radioimmuno-assay and insulin resistance was estimated by homeostasis model assessment (HOMA-IR). Serum A-FABP concentrations were measured by ELISA method.

**Results:** Mean (SD) circulating concentrations of A-FABP were progressively higher according to BMI percentile (mean±SD of A-FABP concentrations in healthy weight, at risk of overweight, and overweight, 8.5±3.7, 14.4±5.2, 22.3±8.7 in male,  $P<0.01$ ; 7.8±4.3, 16.0±7.9, 24.4±8.7 in female,  $P<0.01$ ). Serum A-FABP concentrations correlated positively with weight ( $r=0.52$ ), BMI ( $r=0.58$ ), waist circumference ( $r=0.51$ ), triglyceride ( $r=0.26$ ), fasting insulin ( $r=0.35$ ), and HOMA-IR ( $r=0.32$ ) ( $P<0.01$ ). Serum A-FABP concentrations correlated negatively with HDL-cholesterol ( $r=-0.22$ ) and fasting plasma glucose ( $r=-0.18$ ) ( $P<0.05$ ).

**Conclusions:** A-FABP was closely associated with obesity and insulin resistance in children. The measurement of serum concentrations of A-FABP might be useful for prediction of obesity or insulin resistance-related disorders.

## T1:PS.13

**Acute and chronic regulation of lipid synthesis by adipose tissue lipases**

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Adipocyte lipid content is mostly dependent upon two pathways, lipid hydrolysis (lipolysis by HSL and ATGL) and synthesis (*de novo* and esterification). While regulatory defects in adipose tissue lipases have been documented, regulatory concepts in lipid synthesis are merely beginning to receive warranted attention. Herein, we examined the regulation of lipid synthesis pathways in conditions of altered lipase expression and activities, as is the case in obesity. Therefore, we measured in the human adipose tissue cell line hMADS, lipolytic and esterification fluxes with radiolabeled substrates. Radiolabeled glucose, oleic acid and glycerol-3-phosphate were used as esterification substrates to identify key regulatory steps in lipid synthesis. Lipolytic and esterification fluxes were examined in the following conditions: basal, acute lipolytic stimulation, chronic adenoviral infection and silencing of HSL and ATGL. In the basal state, lipolysis and esterification rates were  $1.01 \pm 0.09$  and  $1.22 \pm 0.17$  nmol/hr/mg protein, respectively. Therefore, important lipid turnover is occurring in non-stimulated conditions, despite lipid accumulation. Stimulation and silencing of HSL and ATGL highlighted *de novo* fatty acid synthesis and activation of fatty acids by acyl-CoA synthase as important regulatory points in the crosstalk between lipolysis and esterification in human adipocytes. Overall, we demonstrate an important lipid turnover in the basal state which can be altered, by acute and even chronic modulations of the lipolytic machinery and flux. Implications of this novel crosstalk between lipolysis and esterification are examined and discussed in the context of human obesity.

## T1:PS.15

**Implication of erk1 in insulin resistance of *ob/ob* mice**Jager, J<sup>1</sup>, Corcelle, V<sup>1</sup>, Aouadi, M<sup>1</sup>, Grémeaux, T<sup>1</sup>, Laurent, K<sup>1</sup>, Waget, A<sup>2</sup>, Pagès, G<sup>3</sup>, Pouyssegur, J<sup>1</sup>, Binétruy, B<sup>4</sup>, Burcelin, R<sup>2</sup>, Le Marchand-Brustel, Y<sup>1</sup>, Bost, F<sup>1</sup>, Tanti, JF<sup>1</sup>.<sup>1</sup> INSERM U568, University of Nice Sophia-Antipolis, Nice, France.<sup>2</sup> INSERM U858, Université Paul Sabatier, Toulouse, France.<sup>3</sup> CNRS UMR 6543, University of Nice Sophia-Antipolis, Nice, France.<sup>4</sup> INSERM U626, Faculty of Medicine, Marseille, France.

Insulin resistance is a main feature of obesity and type II diabetes. Activity of MAP Kinase family members, including ERK, is increased in adipose tissue from obese and type II diabetic animals and patients. Strong evidences suggest that activation of MAPK is implicated in the down-regulation of insulin signaling and action in insulin resistance state.

We have shown that mice lacking ERK1 are resistant to high fat diet induced obesity and protected from insulin resistance due to a decrease in adipogenesis and a higher post-prandial metabolic rate. To investigate the role of ERK1 in the development of insulin resistance in obese mice, we generated leptin-deficient mice (*ob/ob*) invalidated for ERK1 (*ob/ob-erk1-/-*). We found that *ob/ob-erk1-/-* mice remained as obese as *ob/ob* mice but are not hyperglycemic in the fed state unlike *ob/ob* mice. Glucose tolerance test and hyperinsulinemic euglycemic clamp showed an improved insulin sensitivity of *ob/ob-erk1-/-* mice. This phenotype could be explained by a decreased visceral adipose tissue inflammation, known to be implicated in insulin signaling defect, because mRNA expression of inflammatory markers is decreased in adipose tissue of *ob/ob-erk1-/-* mice. Further, expression of genes coding for Glut4 and lipogenic enzymes is also diminished. In contrast no differences were observed in subcutaneous adipose tissue. We also demonstrated that *ob/ob-erk1-/-* are protected from liver steatosis with a reduction in liver triglycerides content and a reduction in ACC (acetyl-CoA carboxylase) expression.

Our data suggest that the specific targeting of erk1 could be of particular interest to fight obesity and insulin resistance.

## T1:PS.14

**AMP-activated protein kinase (AMPK) is activated by lipolysis and protects the adipocyte against oxidative stress and energy depletion.**Gauthier MS<sup>1</sup>, Miyoshi H<sup>2,3</sup>, Souza SC<sup>2,4</sup>, Cacicedo JM<sup>1,5</sup>, Saha AK<sup>1</sup>, Greenberg AS<sup>2</sup>, Ruderman NB<sup>1</sup><sup>1</sup>Diabetes and Metabolism Unit, Department of Medicine Section of Endocrinology, Boston University Medical Center, Boston, MA 02118, USA.<sup>2</sup>Jean Mayer United States Department of Agriculture Human Nutrition Research Center on Aging, Tufts University, Boston, Massachusetts 02111, USA.<sup>3</sup>Hokkaido University Graduate School of Medicine, Sapporo 060-8638, Japan.<sup>4</sup>Novartis Institutes for BioMedical Research, 100 Technology Square, Cambridge, 02139, USA<sup>5</sup>Department of Pathology and Laboratory Medicine, Boston University School of Medicine, Boston MA 02140, USA

Activation of the fuel-sensing enzyme AMPK has been proposed as a therapeutic target for the treatment of obesity and type 2 diabetes. In adipocytes, agents that increase cAMP levels activate AMPK; however, the mechanism(s) responsible for this effect and its physiological relevance are unclear. To examine these questions, studies were conducted with cultured adipocytes. Treatment of 3T3-L1 adipocytes with agents that raise cAMP stimulated lipolysis and activated AMPK. When lipolysis was inhibited with the general lipase inhibitor orlistat, AMPK activation by these agents was diminished. Furthermore, both forskolin-stimulated lipolysis and AMPK activation were abolished by shRNA-mediated silencing of adipose triglyceride lipase. Forskolin treatment increased the AMP:ATP ratio (4-fold), and this too was reduced by orlistat. When acyl-CoA synthetase, which catalyzes the conversion of fatty-acids to fatty-acyl-CoA, was inhibited with triacsin C, both the activation of AMPK and the increase in the AMP:ATP ratio were blunted. Isoproterenol-induced stimulation of lipolysis also increased reactive oxygen species production and the magnitude of this effect was quintupled in adipocytes incubated with the AMPK inhibitor compound C. Moreover, the isoproterenol-induced increase in the AMP:ATP ratio was much greater in these cells, indicating they were more energy stressed. In conclusion, the results indicate that activation of AMPK by agents that raise cAMP requires that lipolysis be increased. They also indicate that this AMPK activation is due to an increase in the AMP:ATP ratio that requires the acylation of intracellular fatty-acids. Finally, they suggest that AMPK activation protects the adipocyte against lipolysis-induced oxidative stress and energy depletion.

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## T1:PS.16

**Dissociation of obesity and insulin resistance in transgenic mice with skeletal muscle expression of uncoupling protein 1.**

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We evaluated the effect of skeletal muscle mitochondrial uncoupling on energy and glucose metabolism under different dietary challenges. Transgenic HSA-mUCP1 mice with ectopic expression of uncoupling protein 1 in skeletal muscle and wildtype littermates were fed for 3 months semi-synthetic diets with varying macronutrient ratios (energy % carbohydrate:protein:fat): HCLF: (41:42:17), HCHF (41:16:43); LCHF (11:45:44). Body composition, energy metabolism and insulin resistance were assessed by quantitative NMR, indirect calorimetry, and insulin tolerance test, respectively. Finally, plasma metabolites were measured and gene expression in muscle, liver and white fat determined using real time PCR.

In wildtype, both high fat diets led to an increase in body weight and fat. HSA-mUCP1 mice considerably increased body fat on the HCHF diet but stayed lean on the other diets. Irrespective of differences in body fat content, HSA-mUCP1 mice were much more insulin sensitive and had lower insulin levels and liver triglycerides compared to wildtype. Respiratory quotient and gene expression indicated overall higher carbohydrate oxidation of HSA-mUCP1 but a preferential channeling of fatty acids into muscle rather than liver at high fat diets compared to wildtype. Evidence for increased lipogenesis in white fat of HSA-mUCP1 mice suggests an increased energy dissipating substrate cycling.

We conclude that skeletal muscle mitochondrial uncoupling does not protect from the development of obesity in all circumstances. Rather it can lead to a "healthy" obese phenotype by preserving insulin sensitivity and a high metabolic flexibility and thus protecting from the development of obesity associated disturbances of glucose homeostasis.

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**T1:PS.17****Rapid effect of 3,5-diiodo-L-thyronine on mitochondrial fatty acid metabolism in skeletal muscle.**

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3,5-diiodo-L-thyronine (T2) administration to high fat fed rats, reduces adiposity and body weight gain by stimulating hepatic fatty acid oxidation with a concomitant less efficient utilization of lipid substrates (Lanni et al.(1995) *Faseb J.* 19:1552-1554). Moreover, when chronically or acutely injected into hypothyroid rats, T2 is able to increase resting metabolic rate, lipid metabolism and survival to cold. Skeletal muscle, endowed with significant mitochondrial capacity, is an important site for glucose disposal, lipid oxidation and thermogenesis, its mitochondrial proton-leak accounting for a significant fraction of resting metabolism, thus the effects of T2 on skeletal muscle would be of great physiological relevance. To test if this iodothyronine could affect skeletal muscle metabolism we injected a single dose of T2 (25micrograms/100g bw) in hypothyroid rats and we measured: a) fatty acid oxidation, b) the activity of some enzymes involved in mitochondrial fatty acids uptake and utilization and c) mitochondrial uncoupling. Within 1h following T2 injection i) mitochondrial fatty acid oxidation was increased (+80% vs hypothyroid rats) together with carnitine palmitoyl-transferase (CPT) activity (+35% vs hypothyroid rats), ii) AMP-activated protein kinase (AMPK)-phosphorylation levels as well as acetyl-CoenzymeA-Carboxylase (ACC)-phosphorylation levels were enhanced, thus suggesting the involvement of AMPK in the CPT activation by T2. Moreover, T2 injection induced a significant increase (+55%vs hypothyroid rats) of the mitochondrial thioesterase-I activity and a less efficient utilization of lipid substrates through an induction of fatty acid-dependent mitochondrial uncoupling. These data give further insight on the effects of T2 highlighting skeletal muscle as one of its targets.

**T1:PS.19****PPAR $\alpha$  can control the expression of metabolism genes in human white adipocytes.**

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The nuclear receptor PPAR $\alpha$  plays a major role in the control of lipid metabolism by regulating the expression of genes of  $\beta$ -oxidation, ketogenesis and peroxisomal oxidation pathways. PPAR $\alpha$  is highly expressed in liver and brown fat, tissues with high fatty acid oxidation rates. Surprisingly, PPAR $\alpha$  is also expressed in human white adipose tissue, where PPAR $\gamma$  is abundant. Our group has shown that in human mature adipocytes, activation of PPAR $\alpha$  with its agonist GW7647 leads to enhanced expression and activity of the glycerol kinase (GyK) gene, probably as a result of direct activation of GyK transcription by PPAR $\alpha$ . We further investigated this unexpected role for PPAR $\alpha$  in regulation of white adipocyte gene expression. Pangenomic micro-arrays were used to compare mRNA profiles of human mature adipocytes treated with GW7647 or with PPAR $\gamma$  agonist, Rosiglitazone. A one class analysis using SAM software established two lists of 1700 genes whose expressions were significantly modified by BRL or GW7647 treatment (FDR < 5%). A two class paired comparison of these lists, that has been validated by RT-qPCR, yield 80 genes differentially expressed between treatments. Five genes were more expressed when PPAR $\alpha$  was activated and the expression of 75 genes was higher with PPAR $\gamma$  agonist. PPAR $\alpha$  activation upregulates genes of the  $\beta$ -oxidation pathway and downregulates genes of the glycolytic pathway. To assess the impact of PPAR $\alpha$  on adipocyte metabolism, the glycolytic flux and palmitate oxidation are measured in adipocytes where PPAR $\alpha$  is either activated by its agonist or silenced using siRNA. This work is part of the project "Hepatic and adipose tissue and functions in the metabolic syndrome" (HEPADIP, see <http://www.hepadip.org/>), which is supported by the European Commission as an Integrated Project under the 6th Framework Programme (Contract LSHM-CT-2005-018734).

**T1:PS.18****Increased glucose tolerance in ob/ob diabetic mice treated with norfloxacin and ampicillin**

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Recent data has shown that germ free mice inoculated with gut microbiota from obese diabetic mice gain more fat than mice inoculated with flora from lean mice. However, it is not clear whether gut microbiota is involved in insulin resistance. The aim of this study was to examine the influence of the gut microflora in the pathophysiology of diabetes by modulating the intestinal microbiota of ob/ob diabetic mice using an antibiotic treatment. A 2 week administration of norfloxacin and ampicillin (1g/l each in drinking water) reduced the cecal bacterial DNA concentrations below detection limit, indicating that the number of intestinal bacteria was significantly reduced by the treatment. Similarly, the concentration of plasma lipopolysaccharide from Gram-negative bacteria was also lower in mice receiving antibiotics. In addition, the treated ob/ob mice showed a much improved glycemic control with normalized basal glycaemia, restoration of liver glycogen storage and increased oral glucose tolerance. Elevated plasma adiponectin concentrations in the treated mice supported the beneficial effects of the antibiotic treatment. These benefits were independent of food intake or body weight, since pair-fed mice weighed less but were as insulin resistant as the control animals. Hepatic triglycerides were also lower in the treated mice, and this result was associated with an up-regulation of hepatic fatty acid oxidation gene CYP4a10. In summary, present results indicate that gut microbiota modulation via antibiotics alters the metabolic and inflammatory status associated with insulin resistance, and results in improved glycemic control in obese and insulin resistant ob/ob mice.

**T1:PS.20****Oral Supplementation with Physiological Doses of Leptin During Lactation in Rats Improves Insulin Sensitivity and Affects Food Preferences Later in Life**

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We have previously described that neonate rats supplemented with physiological doses of oral leptin during lactation become more protected against overweight in adulthood (*Int J Obes* 31:199-209, 2007). The purpose of this study was to characterize further the long-term effects on glucose and leptin homeostasis and on food preferences. Neonate rats were supplemented during lactation with a daily oral dose of leptin or the vehicle. We followed body weight and food intake of animals until the age of 15 months, and measured glucose, insulin, and leptin levels under different feeding conditions: *ad libitum* feeding, 14-h fasting, and 3-h re-feeding after fasting. An oral glucose tolerance test (OGTT) and a leptin resistance test were performed. Food preferences were also measured. Leptin-treated animals were found to have lower body weight in adulthood and to eat fewer calories than their controls. Plasma insulin levels were lower in leptin-treated animals than in their controls under the different feeding conditions, as was the increase in insulin levels after food intake. The homeostatic model assessment for insulin resistance index was significantly lower in leptin-treated animals, and the OGTT also indicated higher insulin sensitivity in leptin-treated animals. In addition, these animals displayed lower plasma leptin levels under the different feeding conditions and were also more responsive to exogenous leptin administration. Leptin-treated animals also showed a lower preference for fat-rich food. These observations indicate that animals supplemented with physiological doses of oral leptin during lactation were more protected against obesity and metabolic features of the metabolic syndrome.

## T1:PS.21

**Time course changes of mRNA levels of lipid metabolism related genes upon fasting in muscle**

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Skeletal muscle has the capacity to adapt to metabolic demands, as shifting from carbohydrates and lipids to almost exclusively lipids as fuel substrates upon fasting. We analyzed the time-course response to fasting of key genes of lipid metabolism in male Wistar rats in gastrocnemius (high capacity of shifting) and soleus (highly oxidative) muscles. The feeding conditions studied were: *ad libitum* (control), 4, 8 and 24-hour fasting, and 3-hour refeeding after 8-hour fasting. Uncoupling protein (UCP) 2 and 3, muscle carnitine palmitoyl transferase (CPTm), peroxisome proliferator activated receptor (PPAR) alpha and delta, glucose transporter (GLUT) 4, Insulin Receptor, PPARgamma coactivator (PGC) 1 alpha and beta, MyoD1 and adrenergic receptor (Adrb) 3 mRNAs were analysed by RT-qPCR. Most of mRNAs studied did not show significant changes, whereas UCP3 and PGC1-alpha mRNA levels were up-regulated, with a marked 4-hour fasting peak for PGC1-alpha and with the highest expression of ucp3 after 8/24-hour fasting (decreasing upon refeeding). The magnitude of elevation of UCP3 and PGC1-alpha mRNA levels was significantly higher in gastrocnemius than in soleus. Ucp3 and pgc1-alpha genes seem to be early responsive genes to fasting in skeletal muscle. The transient elevation of PGC1 mRNA can be key factor for the shift to a more oxidative metabolism; accordingly, gastrocnemius shows a higher capacity to elevate the expression of pgc1-alpha, probably related with its bigger capacity, as compared to soleus, to shift metabolism from mixed type to more oxidative, and also in accordance with the later higher elevation of UCP3 mRNA levels.

## T1:PS.23

**NF-kB dependent regulation of IP-10 in 3T3-L1 and human primary preadipocytes and adipocytes**

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Chemokine secretion by adipocytes and preadipocytes has been postulated to initiate leukocyte infiltration and might mediate the establishment of obesity-related low-grade inflammation. The (IFN)gamma-inducible protein 10 (IP-10/CXCL10), a chemokine with chemoattractant properties for various leukocyte subsets, is expressed and secreted in primary mature human adipocytes. Elevated IP-10 serum concentrations correlate positively with the incidence of type 2 diabetes. Aim of this work was to study the mechanism of IP-10 transcriptional regulation in murine 3T3-L1, primary human preadipocytes and adipocytes and to characterize the relative contribution of preadipocytes and adipocytes to IP-10 expression/secretion. In 3T3-L1 cells, IP-10 expression and secretion was significantly regulated by NF-kB as shown by chemical interfering with blockers of different signalling pathways. This was confirmed by specific inhibition of NF-kB activity using stable overexpression of a transdominant mutant of Ikb-alpha which was found to completely suppress basal and IL-1beta-induced IP-10 expression. In additional experiments in primary human adipocytes, the critical role of NF-kB for IP-10 expression was confirmed. An interesting observation both in the human and murine system was that adipocytes secrete and express significantly higher levels of IP-10 compared to preadipocytes.

In conclusion these data demonstrate a central role for the NF-kB pathway in the regulation of IP-10 in primary human and 3T3-L1 preadipocytes and adipocytes. Furthermore, the results of our study clearly show that adipocytes rather than preadipocytes contribute significantly to obesity-associated elevated IP-10 levels. Future studies should focus on the potential role of this chemokine as a chemoattractant for immune cells in adipose tissue.

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## T1:PS.22

**Identification and characterization of microvesicles secreted by 3T3-L1 adipocytes**

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Adipocytes are now recognized as endocrine cells secreting adipocytokines. In this study, we examined secretion of microvesicles by 3T3-L1 adipocytes. We found that MFG-E8, one of the exosomal proteins was present in the microvesicles and was distributed in the sucrose density fractions with 1.13 to 1.20 g/mL corresponding to those for exosomes. Several integral, cytosolic and nuclear proteins were also identified to be microvesicle components by immunoblotting and proteomic analysis. Unexpectedly, adiponectin was also substantially distributed in the microvesicle fractions. Electron microscopic observation revealed that microvesicles secreted by 3T3-L1 adipocytes exhibited heterogeneity in size and comprised both smaller exosome-like and larger membrane vesicles. MFG-E8-associated adiposomes exhibited binding activity toward phosphatidylserine and apoptotic cells. MFG-E8-adiposomes were down-regulated when cultured in the low glucose medium or cultured in the high glucose medium with antioxidant N-acetyl cysteine, while insulin and TNF- $\alpha$  up-regulated MFG-E8-adiposomes. Moreover, MFG-E8 was highly expressed in the hypertrophic adipose tissue, predominantly in adipocyte fractions, of diet-induced obese C57BL/6 mice. Collectively, it is suggested that microvesicles, especially MFG-E8-associated ones, modulate adipose functions under the redox- and hormone-dependent regulation. Based on the above findings, the adipocyte-derived microvesicles were named adiposomes. Further biological functions of adiposomes will be also discussed.

## T1:PS.24

**Regulation of adipose tissue mass by isoforms of Akt/PKB**

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**Objectives:** Clinical and experimental studies suggest that two isoforms of Akt/PKB, Akt1 and Akt2, are important regulators of adipose tissue mass. Adipose tissue mass is determined by both the volume and the number of adipocytes.

In this study, we have generated Akt1 and Akt2-deficient human fat cells in order to identify the mechanisms by which these isoforms influence adipose tissue mass.

**Methods:** Using a lentiviral shRNA system we have generated SGBS preadipocytes and adipocytes stably expressing Akt1 or Akt2 shRNA. Proliferation was assessed by cell counting and <sup>3</sup>H-thymidine incorporation. Adipogenic differentiation was studied by Oil Red O staining and gene expression analysis. Apoptosis was measured by flow cytometry.

**Results:** Lentiviral-mediated expression of isoform-specific shRNA inhibited expression of Akt1 by > 85 % and Akt2 by > 90 %. Knockdown of Akt2 resulted in an inhibition of preadipocyte proliferation. Down-regulation of Akt2 resulted in an inhibition of adipogenic differentiation, while knockdown of Akt1 caused a reduction of triglyceride accumulation. Down-regulation of Akt2 sensitized cells for apoptosis induction by serum deprivation and death receptor triggering.

**Conclusions:** We conclude that Akt2 contributes to the regulation of adipose tissue mass by influencing fat cell number, whereas Akt1 primarily determines adipocyte volume. Future studies will further reveal the role of Akt1 and Akt2 in the regulation of adipose tissue mass *in vivo*.

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## T1:PS.25

**Preadipocyte igf-1 signaling, bioavailability, and responsiveness vary among fat depots**

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Human abdominal subcutaneous preadipocytes have greater replication, adipogenesis, and survival capacities than omental cells. IGF-1 impacts preadipocyte replication, differentiation, and apoptosis. To define contributions of IGF-1 to regional variation in preadipocyte function, we assayed expression of IGF-1, IGF-1 binding proteins (IGFBP1-6), and PAPP-A, which cleaves IGFBP4 and 5, and IGF-1 signaling pathways. IGF-1, IGFBP2 to 5, and IRS-1 and 2 increased during adipogenesis in subcutaneous preadipocytes. IGFBP3 and 4 did not increase in omental cells. IGFBP6 and PAPP-A decreased in differentiating cells from both depots. More PAPP-A was expressed by omental than subcutaneous primary preadipocytes and strains derived from single preadipocytes by expressing telomerase, even after 40 population doublings. 5 fold more PAPP-A protein was secreted by visceral than subcutaneous cells ( $P<0.01$ ). Knocking out PAPP-A in mice caused disproportionate visceral fat loss, as also occurred in IGF1-deficient Ames dwarf mice. Although IGF-1 induced as much IGF1R phosphorylation in human omental as subcutaneous preadipocytes, AKT serine phosphorylation was substantially lower in omental cells. Cyclin D, GSK3 $\beta$  serine phosphorylation, and  $\beta$ -catenin activation by IGF-1 were greater in subcutaneous preadipocytes. IRS-1 serine 636/638 phosphorylation (which inhibits transduction) was increased and IRS-1 expression lower in omental preadipocytes, potentially contributing to visceral preadipocyte IGF-1 resistance. Thus, while omental preadipocytes produce IGFBPs and PAPP-A in a manner that should augment IGF-1 bioavailability, they are resistant to IGF-1. This may reflect a need for visceral preadipocytes to have restricted growth potential due to anatomic constraints, while allowing them to promote effects of IGF-1 on neighboring cell types.

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## T1:PS.27

**Analysis of the molecular and cellular cross-talk between preadipocytes/adipocytes and microvascular endothelial cells**

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**Aims:** Obesity is connected with an increased number of immune cells in white adipose tissue. The endothelium as the barrier between adipose tissue and circulating immune cells in the blood plays an active role in the infiltration process of these cells. The overall aim of this study is to identify factors and elucidate the molecular mechanisms and the cellular interactions involved in the cross-talk of the adipose tissue cells and endothelial cells. In order to mimic the processes *in vitro* we have established human co-culture systems and sensitive assays.

**Methods:** In our system human preadipocytes and adipocytes (SGBS cells) and human microvascular endothelial cells (HMEC-1) are employed. HMEC-1 were treated with conditioned media (CM) of preadipocytes and adipocytes and subsequently analysed using a monocyte adhesion assay, ICAM-1 ELISA, radical oxygen production (ROS) assay and qRT-PCR. The gene expression and secretion profiles of these cells were analysed using qRT-PCR, ELISA and multiplexing techniques.

**Results:** Preadipocytes produced higher levels of pro-inflammatory cytokines such as VEGF, MCP-1, PAI-1, IL-8 and IL-6 as compared to adipocytes at mRNA and protein level. This unexpectedly strong pro-inflammatory character of preadipocytes was confirmed also in our functional assays with HMEC-1. Monocyte adhesion, ICAM-1 protein and ROS production as pro-inflammatory read-outs were significantly increased after treatment with preadipocyte-CM as compared to adipocyte-CM.

**Conclusions:** The contribution of preadipocytes to the total pool of adipokines might be considerable and might even exceed that of mature adipocytes. Furthermore, preadipocytes might operate as potent pro-inflammatory activators of endothelial cells.

## T1:PS.26

**GW9662 and interfering RNA to determine the specific role of PPAR $\gamma$  isoforms during differentiation of human primary preadipocyte**

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**Background:** Rosiglitazone (RTZ) treatment enhances insulin sensitivity by activating PPAR $\gamma$  (peroxisome proliferator and activated receptors  $\gamma$ ) isoforms. This is accompanied by a remodelling of the adipose tissue (AT) and an increase in fat storage. We hypothesized that RTZ acts more specifically on PPAR $\gamma_2$  isoform. In order to investigate the role of PPAR $\gamma_1$  and PPAR $\gamma_2$  during preadipocyte differentiation into mature cells, we analysed human preadipocytes treated with the PPAR $\gamma$  antagonist GW9662 or with lentiviral vectors expressing siRNA of PPAR $\gamma$  isoforms.

**Methods:** Preadipocytes were derived from subcutaneous and visceral biopsies of AT obtained from obese women during gastric by-pass surgery. Subsequently, cells were treated for 7 days with serum-free medium containing dexamethasone and RTZ (DR) and supplemented or not with GW9662. Cells were also used to evaluate the effect of lentiviral vector-mediated siRNA during DR-induced differentiation.

**Results:** As previously reported, DR treatment induces preadipocyte differentiation by enhancing PPAR $\gamma_1$  and PPAR $\gamma_2$  gene expression cells derived from SAT and VAT. Interestingly, GW9662 is able to prevent gene expression of mature adipocyte markers (ap2, adiponectin, LPL and leptin) and lipid droplet accumulation. Concomitantly, GW9662 inhibits the DR-dependent increase of PPAR $\gamma_2$  expression in both SAT and VAT (by 97% and 92% respectively,  $P<0.001$ ). However, it has no significant effect on PPAR $\gamma_1$  expression. Preliminary results using siRNA indicate that our cells are easily infected by lentiviral vectors leading to a decrease of 83% and 89% of PPAR $\gamma_1$  and PPAR $\gamma_2$  gene expression, respectively. The consequence is an abrogation of differentiation processes but with differences compared to the addition of GW9662.

**Conclusions:** GW9662 treatment abrogated RTZ-induced preadipocyte differentiation and lipid accumulation by inhibiting PPAR $\gamma_2$  gene expression, but it did not change PPAR $\gamma_1$  gene expression. These results suggest that PPAR $\gamma_2$  might be the main isoform implicated in fat storage. Functional exploration using interfering RNA should answer this question.

## T1:PS.28

**Effect of blocking VLDL on peripheral lipogenesis and insulin sensitivity in mice**

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Obese patients often present increased plasma very low density lipoprotein (VLDL), a hepatic triglyceride-rich lipoprotein. This increased VLDL is believed to significantly contribute to an excess fatty acid transport into adipose tissues and skeletal muscles thus deteriorate insulin sensitivity. However none of a *direct* study on the impact of VLDL-derived fatty acid transports on insulin sensitivity has yet reported. In this study, we investigated mice without VLDL secretion in order to dissect roles of VLDL on insulin-responsive tissues, i.e. adipose tissue, skeletal muscle and liver. Mice without hepatic microsomal triglyceride transfer protein (*Mttp*) cannot secrete VLDL. As a result of *Mttp* knockdown, mice had very low plasma triglyceride levels compared to mice without mutation. Despite the lower lipid levels, *Mttp* mice developed normal adiposity in chow and in high fat diet. *Mttp* mice also preserved normal muscle triglyceride content. It is most likely due to a normal chylomicron-derived fatty acid transport, since *Mttp* mice are capable of secreting chylomicron, an intestinal triglyceride-rich lipoprotein. As consistent to unchanged lipid contents in these tissues, insulin signaling was normal. However we found that blocking VLDL secretion induced hepatic steatosis without developing hepatic insulin resistance. Therefore we conclude that blocking VLDL has little effect on peripheral lipogenesis and insulin signaling but results in a hepatic steatosis. Steatosis induced by *Mttp* knockdown was dissociated from insulin resistance. We are currently studying mechanisms of the protection from insulin resistance in *Mttp* hepatic steatosis.

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## T1:PS.29

**Adipose 11Beta-HSD1 gene expression and activity are associated with components of the metabolic syndrome and accumulation of visceral adipose tissue**Paulsen, SK<sup>1</sup>, Christiansen, T<sup>1</sup>, Richelsen, B<sup>1</sup>, Pedersen, SB<sup>1</sup><sup>1</sup>Department of Endocrinology and Metabolism C, Aarhus University Hospital, Aarhus Sygehus, Aarhus, Denmark

Pre-receptor amplification of glucocorticoids by 11Beta-HSD1 is believed to increase tissue activity of cortisol and may play a part in the features of the metabolic syndrome. As glucocorticoid excess leads to central fat accumulation and loss of peripheral muscle mass, we investigated the association of adipose 11Beta-HSD1 gene expression and activity with cardiovascular risk factors and body composition in a cross-sectional study of 59 healthy obese individuals (BMI 34.6±3.9). Gene expression was measured by RT-PCR and 11Beta-HSD1 activity as net production of cortisol from cortisone in AT samples obtained by liposuction from the subcutaneous abdominal depot. Volume of visceral, subcutaneous abdominal, subcutaneous gluteofemoral fat depots and of thigh muscle was assessed by MRI. Both 11Beta-HSD1 mRNA and activity in AT were positively associated with HOMA-IR when adjusting for gender and BMI (R=0.422, p<0.001; R=0.345, p<0.05), and negatively associated with HDL-cholesterol (R=-0.225, p<0.05; R=0.282, p<0.05). No correlations were found with total cholesterol, triglycerides, blood pressure, or BMI. Both 11Beta-HSD1 mRNA and activity were positively correlated with visceral fat volume, and negatively correlated with gluteofemoral fat volume, however when adjusting for gender, the negative correlation with gluteofemoral fat volume disappeared. 11Beta-HSD1 activity remained positively associated with visceral fat mass even when adjusting for gender, age, BMI, and HOMA-IR (R=0.386, adjusted-R<sup>2</sup>=0.556, p<0.01), whereas the association disappeared for 11Beta-HSD1 mRNA when adding HOMA-IR to the equation. In conclusion, adipose 11Beta-HSD1 mRNA and activity are associated with components of the metabolic syndrome, including reduced HDL-cholesterol, insulin resistance and may predict accumulation of visceral adipose tissue.

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## T1:PS.32

**Comparable adipogenesis of stromovascular cultures from subcutaneous adipose tissue from men with and without type 2 diabetes**

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Studies have reported reduced expression of adipogenic genes in individuals with type 2 diabetes mellitus (T2DM). We here assessed more directly the adipogenic potential (proliferation and differentiation) of cultured stromovascular (SV) cells isolated from subcutaneous abdominal adipose tissue (biopsies) in matched obese men with and without T2DM (n=10 per group, BMI 32.3 ± 4.7, age 58 ± 11, Means ± SD). SV cells (three sets of triplicates) were seeded at 0.3 × 10<sup>4</sup> cells/cm<sup>2</sup> in 96-well plates in DMEM/F-12 with 10% FBS. Nuclear fluorescence (CyQuant kit, Invitrogen) was determined on day 1 and 4 (2 culture sets) and proliferation was calculated as the fold-increase in fluorescence from day 1-4. At confluence, the third culture set was switched to serum-free differentiation medium for 11 days followed by fluorescent staining for lipids (BODIPY) and nuclei (DAPI). The BODIPY-to-DAPI fluorescence ratio was used as an index of differentiation. There was no difference in SV cells proliferation between T2DM and controls: 6.1 ± 2.0 vs. 5.0 ± 2.7 (p = 0.3). Large inter-individual variability in adipocyte differentiation was observed but again there was no difference between groups: 27 ± 20% in T2DM vs. 22 ± 11% in controls (p = 0.6). These results demonstrate that *in vitro* proliferation and differentiation of adipose tissue-derived SV cells are similar in men with and without T2DM. This suggests that the often reported *in vivo* impaired adipogenesis in diabetes may be due to different physiological milieu of the adipose tissue rather than intrinsic cellular differences.

## T1:PS.31

**Dams oleoyl-estrone treatment modifies gene expression of their descendents in perigonadal tissue**García-Peláez, B<sup>1</sup>, Vilà, R<sup>1,2</sup>, Remesar, X<sup>1,2</sup><sup>1</sup> Department of Nutrition and Food Science, University of Barcelona, Barcelona, Spain<sup>2</sup> CIBER Fisiopatología de la Obesidad y Nutrición, ISC III, Spain

Oleoyl-estrone (OE) induces a decrease in food intake, and a noticeable decrease in body weight through reduction of body lipids with no concurrent loss of protein. Deep changes in maternal intake affect the pups' growth and can program the metabolism of different tissues in order to develop obesity in adulthood.

Lactating dams were treated up to day 15 of lactation with 0.2 mL sunflower oil alone (control and diet-restricted groups) or containing 10µmol/kg/day OE (treated group). After weaning, pups received 4 weeks of standard chow diet (4% lipid) followed by 4 weeks of hyperlipidic diet (22.2% lipid).

Pups' perigonadal adipose tissue was obtained from control and treated groups under normal of hyperlipidic diet and used for gene expression analysis with real-time PCR.

Male control pups showed a marked decrease in lipogenesis (ACC, LPL), an increase in glycerol production (PEPCK) and a decrease in glucose and fatty acids transport (GLUT 4, FATP 1) after receiving a hyperlipidic diet. OE treated animals with standard diet showed non significant decrease in lipogenesis, a tendency to decrease lipolysis and a decrease in adipocyte differentiation (PPAR 2). After 4 weeks of hyperlipidic diet lipogenesis tended to increase, and lipolysis (HSL), glycerogenesis (PEPCK) and adipocyte differentiation increased. Female OE fed standard diet, showed a decrease in adipose differentiation (PPAR 2) and a decrease in lipid extraction (LPL); whereas in the presence of hyperlipidic diet they showed a decrease in lipid oxidation (CPT1, ACAD(1)) and glycerogenesis (PEPCK). OE treated rats showed a marked resistance to store lipids.

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## T1:PS.33

**Molecular Response to Hypoxia in Preadipocytes vs Adipocytes: Hypoxia-induced Expression of Leptin in Preadipocytes**

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We proposed in 2004 that inflammation in adipose tissue in obesity is a response to hypoxia in enlarged adipocytes distant from the vasculature. Adipocytes account for no more than 50% of the total cell content of WAT and preadipocytes also exhibit major inflammatory responses, expressing and secreting a range of inflammation-related adipokines. In this study we have examined the effects of hypoxia on adipokine expression in human preadipocytes, in parallel to adipocytes.

Cultured human preadipocytes (Zen Bio) and differentiated adipocytes (day 15 post-induction) were exposed to 1% O<sub>2</sub> for up to 24 h; control cells were maintained in normoxia. The mRNA level of key adipokines was quantified by real-time PCR (Taqman probes). Cellular levels of the hypoxia-inducible transcription factor HIF-1α and the secretion of adipokines into the medium were measured by ELISAs.

Hypoxia resulted in an increase in HIF-1α protein in both preadipocytes and adipocytes. Similar responses to hypoxia were found in preadipocytes as in adipocytes with some genes, including increases in GLUT1, MIF and VEGF expression. In contrast to mature adipocytes, however, hypoxia did not lead to major changes in preadipocytes in the expression of IL-6, PAI-1 and angiopoietin-like protein 4. Importantly, while preadipocytes do not normally produce leptin, hypoxia resulted in the induction of leptin gene expression in these cells and leptin protein was secreted.

It is concluded that preadipocytes can produce leptin under hypoxic conditions. Preadipocytes within WAT may play an important role in the production of key adipokines in response to hypoxia.

This study was supported by the Biotechnology and Biological Sciences Research Council.

## Track 1 Poster Presentations

## T1:PS.34

**Fatty acids and differentiation of progenitor cells isolated from human adipose tissue**

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**Introduction:** Angiogenesis is important for adipogenesis. Adipose tissue contains stromal vascular (SVF) cells, which participate in angiogenesis. Aim of the study was to observe the influence of fatty acids on proangiogenic vs proadipogenic properties of human SVF cells isolated from subcutaneous adipose tissue.

**Methods:** SVF cells were cultured in proangiogenic (EBM with 2% FCS), or proadipogenic (DMEM without serum, but with insulin, dexamethasone, IMBX) medium. Cells were characterized by the expression of surface antigens (flow cytometry) and by cells, as well as for adipocytes (qRT-PCR and microarray). Influence of the 24-hour incubation with 1-30 $\mu$ M of palmitic, oleic, arachidonic, eicosapentaenoic acids on proliferation (BrdU), migration were assessed. Differentiation to adipocytes was confirmed by the lipid droplets (Oil-red-O).

**Results:** Dependently to the medium SVF differentiated to adipocyte- or to endothelial-like cells as documented by the pattern of gene expression. The proangiogenic SVF cells proliferate, migrate and form the capillary-like structure in the *in vitro* 3D model of angiogenesis. FFA did not change cell proliferation, but AA activated cell chemotaxis. Unsaturated FA were more potent in activation of expression of genes characteristic for adipocytes, when saturated were more effective in regulation of proangiogenic (homing) genes. The expression of connexin43 by OA dominated in SVF.

**Conclusion:** FFA determine pattern of differentiation of SVF toward endothelial vs adipogenic progenitors

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## T1:PS.36

**In situ proliferation of the CD34<sup>+</sup>/CD31<sup>+</sup> progenitor cells within the human subcutaneous adipose tissue and modulating roles of the microenvironment.**

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The excessive development of adipose tissue (AT) is the result of both hypertrophy and hyperplasia of the main cellular component of AT, the adipocytes. Surprisingly, few data are available concerning the identity of the adipocyte precursor cell. Among the AT stroma-vascular fraction, the CD34<sup>+</sup>/CD31<sup>+</sup> cell population was shown to be the only one that possesses adipogenic capability. The present study was undertaken to evaluate the proliferative status of the CD34<sup>+</sup>/CD31<sup>+</sup> progenitor cells within human subcutaneous AT and to determine whether stimuli originating from the microenvironment in which CD34<sup>+</sup>/CD31<sup>+</sup> cells reside such as adipokines and oxygen tension, could modulate their proliferation.

We demonstrate, using Ki67 as a proliferation marker, that progenitor cells within the human AT were in proliferative state, the proportion of which being positively modulated by the adiposity of the patients and associated to an increased number of small size adipocytes (diameter<60 $\mu$ m).

Moreover, mature adipocyte- and endothelial cell-conditioned media as well as 48 hours of low oxygen tension (1%O<sub>2</sub>) induced the proliferation of the CD34<sup>+</sup>/CD31<sup>+</sup> cells "in vitro" whereas macrophage-conditioned media were antiproliferative (evaluated by BrdU incorporation assay). Among the adipokines possibly involved, leptin, VEGF, IL-6 and LPA were shown to enhance the proliferation of the CD34<sup>+</sup>/CD31<sup>+</sup> cells whereas adiponectin was without effect.

The present study suggests that fat mass extension is associated with the proliferation of AT-derived progenitor cells involving local stimuli arising from mature adipocytes and endothelial cells as well as decreased local oxygen tension.

## T1:PS.35

**Sirt1 is involved in resveratrol-stimulated changes in human adipocytes**

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**Objectives:** Calorie restriction (CR) leads to retardation of the aging processes and to longer life in many organisms. This effect of CR can be mimicked by resveratrol, a sirtuin-activating compound present in grapes and red wine. One main effect of CR in mammals is a reduction of body fat from white adipose tissue.

We have shown earlier that resveratrol influences human fat cell number and function. In this study, we sought to identify the underlying molecular mechanisms.

**Methods:** Using a retroviral system we generated human SGBS preadipocytes and adipocytes stably expressing Sirt1 shRNA. Proliferation, adipogenic differentiation, *de novo* lipogenesis, and secretory functions were studied.

**Results:** Resveratrol inhibited human preadipocyte proliferation and conversion into mature adipocytes. These effects were abrogated in SGBS preadipocytes stably expressing Sirt1 shRNA. Furthermore, resveratrol inhibited *de novo* lipogenesis by down-regulating glucose transporter-4 (Glut-4) expression. This inhibitory effect was not influenced by down-regulation of Sirt1 in SGBS adipocytes. Resveratrol inhibited the secretion of IL-6 and IL-8 into the medium supernatant, while the concentration of total adiponectin remained constant. However, resveratrol stimulated the formation of high molecular weight (HMW) adiponectin.

**Conclusions:** Our data suggest that resveratrol might influence adipose tissue size by several mechanisms involving Sirt1. Furthermore, by influencing the endocrine function of human pre- and adipocytes, resveratrol might positively interfere with the development of obesity associated co-morbidities. Therefore, our findings open up the new perspective that resveratrol could be used as a drug to prevent or to treat obesity-associated endocrine and metabolic adverse effects.

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## T1:PS.37

**Aging increases ppar $\gamma$  transactivation in adipocytes by modulating the balance in nuclear cofactors**

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Aging is associated with increased adiposity, which contributes directly to some diseases such as type 2 diabetes and atherosclerosis. It has been proposed that oxidative stress might be involved in age-induced fat accretion. We have hypothesized that aging causes an imbalance in nuclear cofactors, which greatly impacts the transcriptional activity of PPAR $\gamma$ , a key regulator of adipocyte biology. To test this, mice of 4, 12 and 24 months old were treated with the PPAR $\gamma$  agonist pioglitazone (pio), all at a daily dose of 10 mg/kg for one week. Pioglitazone decreased triglyceridemia more in young than old mice, but old mice had a higher pio-induced increase in adipose tissue weight compared to that of their younger counterparts. PPAR $\gamma$  mRNA and protein levels were similar between the three age groups, suggesting that aging induces a change in nuclear transcriptional milieu, notably nuclear cofactors. We then screened the age-induced changes in the expression levels and DNA binding of 15 established PPAR $\gamma$  cofactors using 3T3-L1 adipocytes and adipose tissue from young and old mice, rats and humans. Our findings suggests that SCR-1 mRNA and protein levels are lowered upon aging. Because SRC-1 is important for adipogenesis and insulin sensitization effects of PPAR $\gamma$  (Picard et al, Cell, 2002), these data could explain in part the metabolic alterations that occurs in adipose tissue during the life span.

This work was funded by a grant from the Canadian Institutes of Health Research.

## T1:PS.38

**Maternal pre-pregnancy body mass index and infant growth in the Amsterdam Born Children and their Development (ABCD) study**Vrijkotte, TGM<sup>1</sup>, Van der Wal FM<sup>2</sup>, Gemke RJB<sup>3</sup>, Bonseil G<sup>4</sup><sup>1</sup>Department of Social Medicine, Academic Medical Centre, Amsterdam, The Netherlands<sup>2</sup>Department of Epidemiology, Documentation and Health Promotion, Municipal Health Service, Amsterdam, The Netherlands<sup>3</sup>Department of paediatrics, VU medical Centre, Amsterdam, The Netherlands<sup>4</sup>Institute Health Policy & Management, Erasmus Medical Centre, Rotterdam, The Netherlands.

**Objective:** Maternal underweight and overweight may adversely affect fetal growth and development. We studied the relation between maternal pre-pregnancy body mass index (pbmi) and infant growth during the first 2 years.

**Study Design:** Prospective population-based cohort study.

**Subjects:** Singleton born infants from the ABCD-study with growth data (N=3773).

**Measures:** pbmi was self-reported and analysed in 5 levels. Children's growth data included: weight, length and BMI, repeatedly measured 10 times on average during first 2 years, transformed into Standard Deviation Scores (SDS; age and gender specific Dutch reference). Multi level analysis was performed. Results were adjusted for maternal age and height, parity, gestational age, birthweight, maternal education, smoking during pregnancy, ethnicity, duration of breast feeding.

**Results:** Low pbmi was related to decreased, high pbmi to increased SDS for weight, length and BMI during infancy; interaction with the child's age was not significant. After adjusting for all relevant factors, birthweight showed the largest effect, the relation was attenuated but still significant for weight and BMI.

**Conclusions:** pbmi is related to infant growth, partly due to its influence on birthweight. Maternal Underweight has larger effects than overweight.

Table 1

mat pBMI (kg/m <sup>2</sup> )	N	SDS weight		SDS length		SDS BMI (child)	
		unadjusted • sds:±se	adjusted • sds:±se	unadjusted • sds:±se	adjusted • sds:±se	unadjusted • sds:±se	adjusted • sds:±se
<18	115	-0.45±0.09***	-0.17±0.07***	-0.31±0.08***	-0.05±0.06	-0.31±0.09***	-0.17±0.08*
18-20	529	-0.19±0.04***	-0.08±0.03***	-0.11±0.04***	-0.02±0.03	-0.17±0.04***	-0.11±0.04**
20-25	2199	ref	ref	ref	ref	ref	ref
25-30	691	0.16±0.04***	0.09±0.03***	0.03±0.04	0.02±0.03	0.19±0.04***	0.11±0.04**
>30	239	0.20±0.06***	0.06±0.05	0.04±0.06	-0.01±0.05	0.23±0.06***	0.09±0.06

\*\*\* p&lt;.001, \*\* p&lt;.01, \* p&lt;.05

## T1:PS.40

**Obesity affects the regional distribution of bone density and mass - a monozygotic twin pair study**Sovijärvi, O<sup>1,2</sup>, Kaprio, J<sup>1</sup>, Rissanen, A<sup>2</sup>, Yki-Järvinen, H<sup>3</sup>, Pietiläinen, K<sup>1,2,3</sup><sup>1</sup>Finnish Twin Cohort Study, Department of Public Health, University of Helsinki, Finland<sup>2</sup>Obesity Research Unit, Department of Psychiatry; Helsinki University Central Hospital, Finland<sup>3</sup>Department of Medicine, Division of Diabetes, Helsinki University Central Hospital, Finland<sup>4</sup>Department of Public Health, University of Helsinki and Department of Mental Health and Alcohol Research, National Public Health Institute, Helsinki, Finland.

**Background and objectives:** Obesity is thought to increase bone mass. Using a twin design of obesity discordant pairs, we examined the relationship of regional bone mineral density and content to obesity-related phenotypes.

**Methods:** Young adult monozygotic (MZ) pairs from the population-based FinnTwin16-study (aged 24-27 years) were used to identify 17 (10 male) obesity-discordant pairs (BMI-difference over 3kg/m<sup>2</sup>). Bone mineral density (BMD), bone mineral content (BMC), fat percentage, lean mass and fat mass were measured using dual energy x-ray absorptiometry, with upper and lower limbs assessed separately.

**Results:** The obese co-twins had higher total BMD (1.23 ± 0.11 g/cm<sup>2</sup> vs. 1.20 ± 0.10 g/cm<sup>2</sup>, pair-wise p<0.01) and BMC (3000 ± 520 g vs. 2807 ± 530 g, p<0.01) than their non-obese counterparts. Fat percentage (36.5% vs. 27.8%) and fat mass (31.9 vs. 20.2 kg) was expectedly much greater among obese co-twins than the non-obese, but no difference in lean mass (48.8 ± 12.9 kg vs. 50.8 ± 11.7 kg, p=0.41). Upper limb BMD (p= 0.24) and lower limb BMD (p= 0.12) did not differ between obese and non-obese co-twins. No differences for their upper limb BMC (383.2 ± 100 g vs. 377.4 ± 101g, p= 0.35) were seen, but obese co-twins had significantly greater lower limb BMC (1140.7 ± 232 g vs. 1048.5 ± 210 g, p<0.001) than the lean twins.

**Conclusions:** The findings indicate that obese monozygotic co-twins have thicker bones than the leaner ones, especially in lower limbs. Weight load seems to be an important factor to increase bone mineral content.

**Funding:** This work was supported by the Academy of Finland Centre of Excellence in Complex Disease Genetics and DIOGENES - Diet, genes and obesity (Contract FP6-513946): <http://www.diogenes-eu.org/>.

## T1:PS.39

**Conversion of white preadipocytes to a brown adipocyte pattern of gene expression by displacing CHOP10 from bZIP heterodimers bound to the cAMP response element on the PGC-1alpha promoter.**

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**Background:** cAMP activation of PGC-1alpha and UCP1 expression is an essential step in the commitment of preadipocytes to the brown adipose tissue lineage. We have demonstrated that forskolin sensitive PGC-1alpha expression can be induced in white 3T3-L1 cells by overexpression of C/EBPbeta acting through the CRE element of the PGC-1alpha proximal promoter. Here we aim to establish whether overexpression of C/EBPbeta alters the competition of bZIP transcription factors binding to the PGC-1alpha-CRE.

**Methods:** Luciferase assays were performed using 3T3-L1 and HIB-1B cells co-transfected with a reporter construct containing the PGC-1alpha proximal promoter and expression plasmids for C/EBPbeta, CREB, ATF-2 and CHOP-10. Knock-down of CHOP10 in 3T3-L1 cells was achieved by RNAi. Chromatin immunoprecipitation (ChIP) assays were performed using anti-C/EBPbeta, anti-CREB, anti-ATF-2 and anti-CHOP10 in preadipocytes treated with forskolin to stimulate cAMP.

**Results:** Forskolin-stimulated PGC-1α expression in 3T3-L1 cells was upregulated by C/EBPβ and CREB, but inhibited by ATF-2 and CHOP10 overexpression. Co-transfection studies demonstrated that CHOP10 completely inhibits the stimulatory effect of C/EBPβ overexpression on PGC-1α promoter in preadipocytes. ChIP assays demonstrated that overexpression of C/EBPβ results in strong binding of CREB and C/EBPβ on the PGC-1alpha-CRE, while displacing binding of ATF-2 and CHOP10 in response to forskolin. Studies are in progress to determine the effect of RNAi knockdown.

**Conclusions:** We conclude that overexpression of C/EBPbeta induces a brown preadipocyte pattern of gene expression in white 3T3-L1 preadipocytes by displacing the repressive CHOP10 from bZIP heterodimers bound to the cAMP response element on the PGC-1alpha promoter.

## T1:PS.41

**PCR Arrays Identify Metallothionein-3 (MT-3) as a Highly Hypoxia-Inducible Gene in Human Adipocytes**

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We have proposed that inflammation in white adipose tissue in obesity reflects a response to hypoxia as tissue mass expands, large adipocytes becoming hypoxic as their distance from the vasculature increases. Using a candidate gene approach, the production of several key inflammation-related adipokines has been shown to be changed by hypoxia in human adipocytes. We have now used PCR arrays to investigate the effects of hypoxia on gene expression in human adipocytes.

Human preadipocytes (Zen Bio) were differentiated to adipocytes and at 14 days post-differentiation were exposed to 1% O<sub>2</sub> for 24 h; control cells were maintained in normoxia. RNA was extracted and cDNAs applied to hypoxia signalling pathway PCR arrays (Superarray) containing 84 hypoxia-sensitive genes.

Application of the PCR arrays showed that expression of 12 genes was upregulated by hypoxia while 9 genes were downregulated. The genes altered by hypoxia in the candidate gene study (including angiopoietin-like protein-4, IL-6, leptin, MIF, VEGF) were also changed with the arrays. The arrays showed, however, that the expression of one gene – metallothionein 3 (MT-3) – was dramatically upregulated in hypoxia, there being a >600-fold increase in mRNA level. The powerful induction of MT-3 expression in human adipocytes by low O<sub>2</sub> tension was confirmed by RT-PCR and real-time PCR with Taqman probes, and was found to occur within 60 min of exposure to hypoxia.

This study indicates that MT-3 is a major hypoxia-sensitive gene in human adipocytes. MT-3, also known as growth inhibitory factor, may act as a protectant against hypoxia-induced cellular damage.

This study was supported by the Biotechnology and Biological Sciences Research Council.

## T1:PS.42

**Evaluation of endothelial progenitor cells in obese patients with hypertension**Bogdanski P<sup>1</sup>, Pupek-Musialik D<sup>1</sup>, Kasprzak-Miller E<sup>2</sup>, Luczak M<sup>1</sup><sup>1</sup>Department Of Internal Diseases, Metabolic Disorders And Hypertension, University Of Medical Sciences <sup>2</sup>Department of Biochemistry and Molecular Biology, University of Medical Sciences

**Introduction:** Endothelial progenitor cells (EPC) derived from bone marrow are believed to have role in the endogenous maintenance and repair of endothelium. Growing number of evidences suggest that cardiovascular risk factors may reduce the number and impair the functional capacity of circulating endothelial progenitor cells. The aim of the study was to evaluate number of endothelial progenitor cells in obese patients with hypertension.

**Methods:** 20 individuals were studied - 10 obese patients with hypertension and 10 healthy lean subjects used as a control. We have studied the number of the endothelial progenitor cells colony-forming units. A 10-ml sample of venous blood was used for the isolation of endothelial progenitor cells. Peripheral-blood mononuclear cells were isolated by Ficoll density-gradient centrifugation. Isolated cells were subsequently resuspended in growth medium and plated on the 6-well fibronectin-coated dishes. After 48 hours then nonadherent cells were collected and then replated onto 24-well fibronectin-coated dishes for a final assessment of the number of colonies. At day 5 of the assay were counted under the light microscope.

**Results:** The number of colony-forming units was significantly lower in studied group as compared to the control ( $p < 0.05$ ).

**Conclusions:** Obesity and hypertension is associated with decreased number of endothelial progenitor cells. The reduction of endothelial progenitor cells in this group of patients should be considered as a novel mechanism leading to cardiovascular complications.

## T1:PS.44

**Vagotomy for treatment of obesity**

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The vagus coordinates central and peripheral nutrient sensing and governs most gastrointestinal functions. Truncal vagotomy causes weight loss or slowed growth via unknown mechanisms. Vagal brain-stem afferentectomy, superselective intraabdominal vagotomies and chemoablation of afferent transmission have contributed to the understanding of vagal physiology, whereas electrostimulation and nerve block are still in early stages of development; anti-cholinergics have limited therapeutic use in obesity because of side-effects. In 1977-1980 open truncal vagotomy (TV) without drainage in 21 severely obese patients curbed appetite causing weight loss, with trivial and transient side-effects. These 21 patients with TV and 37 patients with TV plus vertical banded gastroplasty compared to 51 patients randomized to gastroplasty alone during 1980-1995 demonstrate very long-term (mean: 20 yrs) effects of open TV (follow-up:90%). Reoperation rates and all-cause mortality were similar in patients with and without TV. Mean BMI loss in gastroplasty patients with vagotomy is  $7.8 \pm 1.4$  (sem) versus  $6.1 \pm 1.0$  in gastroplasty alone ( $p < 0.05$ ), corresponding to 44% excess weight loss (EWL) versus 33% over the very long term. 52% TV "responders" (BMI loss  $\geq 8$ ) had a mean 79%EWL compared to 62% among 45% "responders" with gastroplasty alone. Preliminary studies of laparoscopic TV alone and combined with adjustable banding demonstrate similar weight loss and safety outcomes.

**In conclusion:** TV has robust long-term effects on body weight, although weight loss is modest in middle-aged severely obese patients. As with all obesity treatment, patient selection is critical and favors younger patients with less disease to minimize volitional breakdown and cognitive override of autonomic function.

## T1:PS.43

**Increased Vagal Activity stimulates cell proliferation in visceral organs.**Inoue, S<sup>1</sup>, Suzuki, Y.<sup>1</sup>, Kintaka, Y.,<sup>1</sup> Nakada, E.,<sup>1</sup> Osaka, T.<sup>2</sup><sup>1</sup> Department of Clinical Nutrition, Kyoritsu Women's University, Japan<sup>2</sup> National Institute of Health and Nutrition, Japan

**Background:** Ventromedial hypothalamic (VMH) lesions in rats induces cell proliferation in visceral organs (stomach, small intestine, liver and pancreas) through vagal hyperactivity. Our newly developed VMH lesions in mice also induces cell proliferation in visceral organs

**Objective:** To examine whether drug-induced vagal hyperactivity induces cell proliferation in visceral organs in mice.

**Methods:** Ten weeks-old mice were divided into three groups: VMH lesioned, carbachol, a vagal stimulating drug, infused and saline infused (control) groups. Daily food intake and body weight were measured. At 7 days later, blood was taken for determining serum glucose, cholesterol, triglycerides, insulin and leptin. Visceral organs were excised for examining cell proliferation by proliferating cell nuclear antigen (PCNA) and Hematoxylin-Eosin stainings.

**Results:** VMH lesioned mice induced cell proliferations (increased PCNA positive cell in all organs and increased mucosal height in the small intestine) in the visceral organs with remarkable increase in food intake, body weight, body fat, serum insulin and serum leptin. Carbachol infused mice also induced cell proliferation in the visceral organs without associations of other abnormalities seen in the VMH lesioned mice. The results demonstrated that the VMH lesions-induced cell proliferation in visceral organs can be induced by more general procedure of vagal hyperactivity.

## T1:PS.45

**Assessing the weight and height trend of neonates during 3 past decades in Iran**

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**Background:** Weight-for-length adequacy and weight/height index alone are able to identify newborns at risk for some selected neonatal diseases. Size and maturity at birth have relationship to age at menarch. It also is a risk factor for type 2 diabetes. Children who are large for gestational age at birth are at increased risk of developing MS. Studies show that the proportion of infants with low birth weight are increasing since 1970's. We examined the trend of our anthropometric datas of neonates during 3 past decades.

**Materials & methods:** This study is a librarian one. Datas have been gathered on the basis of thesis, articles and research projects of Tehran, Shaid Beheshti, Iran's medical universities during 1971-2001 years. The keywords used in this study were "birth weight", "birth height", "trend", "malnutrition", "decades" "Iran". The databases used for electronic searches was IRANMEDEX. Number of cases of boys and girls, birth weight and height datas (mean $\pm$ SD) in urban neonates during 3 past decades assessed. With consideration of sample sizes of studies as weight each study, combined total mean and standard deviation has been calculated.

**Results:** Data gathering for birth weight and birth height during (1971-81) and (1982-91) decades were available for 6909 and 483 girls respectively whereas during (1992-2001) decade were 2040 for weight and 1905 for height. Data gathering for birth weight and birth height during (1971-81) and (1982-91) decades were available for 7331 and 540 boys respectively whereas during (1992-2001) decade were 2121 for weight and 1971 for height. The mean $\pm$ SD for weight in girls were  $3110 \pm 510$ ,  $2890 \pm 660$ ,  $3130 \pm 490$  gr and in boys were  $3220 \pm 550$ ,  $3000 \pm 466$ , and  $3300 \pm 510$  gr in 3 past decades respectively. The mean $\pm$ SD for height in girls were  $50.44 \pm 2.48$ ,  $46.97 \pm 4.18$ , and  $49.63 \pm 2.27$  cm and in boys were  $51.13 \pm 2.63$ ,  $47.79 \pm 3.85$ , and  $50.15 \pm 2.13$  cm.

**Conclusion:** Up to now we haven't seen any specific trend in birth weight and birth height during 3 past decades in Iran.

## T1:PS.46

**Geranylgeranyl pyrophosphate is an endogenous regulator of adipocyte differentiation.**Goto, T<sup>1</sup>, Takahashi, N<sup>1</sup>, Egawa, K<sup>1</sup>, Uemura, T<sup>1</sup>, Teraminami, A<sup>1</sup>, Kawada, T<sup>1</sup><sup>1</sup>Division of Food Science and Biotechnology, Graduate School of Agriculture, Kyoto University, Uji, Japan

It has been suggested that isoprenoids affect cellular processes by multiple mechanisms. Isoprenoids, such as farnesyl pyrophosphate (FPP) and geranylgeranyl pyrophosphate (GGPP), regulate transcriptional and posttranscriptional events that affect various biological processes. In this study, we investigated the effects of FPP or GGPP on adipocyte differentiation because several adipocytokines, which are secreted molecule from adipocyte, have been reported to be involved in systemic insulin responsiveness, and their secretions are closely related to adipocyte differentiation.

In 3T3-L1 cells, addition of GGPP during adipocyte differentiation significantly reduced the expression of adipogenic marker genes, such as adipocyte fatty acid binding protein and peroxisome proliferators activated receptor  $\gamma$ , and insulin-stimulated glucose uptake. On the other hand, FPP was not effective. The effects of GGPP partially diminished in the presence of liver X receptor (LXR) agonist T0901317, but unchanged in the presence of geranylgeranyl transferase inhibitor GGTI-286. Intracellular GGPP levels were increased in parallel with adipocyte differentiation. Moreover the expression levels of geranylgeranyl pyrophosphate synthase 1 (GGPS1) which catalyzes the formation of GGPP from FPP increased after differentiation. In 3T3-L1 cells, stably overexpressing FLAG-tagged GGPS1, intracellular GGPP levels were significantly elevated. In these cells, after differentiation induction, both the expression of adipogenic marker genes and insulin-stimulated glucose uptake were reduced. In genetic and diet induced obese mouse white adipose tissue, GGPS1 mRNA expression was up-regulated. These results suggest that GGPP may perform as an endogenous regulator of adipocyte differentiation by a mechanism that is partially dependent on the LXR pathway.

## T1:PS.48

**Gene expression levels of the corepressor rip140 are downregulated in omental adipose tissue of obese subjects**Lizanzu, A<sup>1</sup>, Catalán, V<sup>1,4</sup>, Rotellar, F<sup>3,4</sup>, Hernández-Lizóain, J L<sup>3</sup>, Baixauli, J<sup>3</sup>, Cienfuegos, J A<sup>3,4</sup>, Rodríguez, A<sup>3,4</sup>, Gómez-Ambrosi, J<sup>1,4</sup>, Salvador, J<sup>2,4</sup>, Frühbeck, G<sup>1,2,4</sup><sup>1</sup>Metabolic Research Laboratory and Departments of <sup>2</sup>Endocrinology, and <sup>3</sup>Surgery, Clínica Universitaria de Navarra, University of Navarra, Pamplona, and <sup>4</sup>CIBER Fisiopatología de la Obesidad y Nutrición, Instituto de Salud Carlos III, Spain

**Introduction:** Receptor Interacting Protein 140 (RIP140) is a corepressor for nuclear receptors that inhibits energy expenditure. Mice lacking this gene are lean, resistant to high-fat diet-induced obesity, at the same time as exhibiting an increased glucose tolerance and insulin sensitivity. The aim of this study was to analyse the effect of obesity on RIP140 expression levels in human omental adipose tissue.

**Patients and methods:** Omental adipose tissue from 17 volunteers was used in the study. Subjects were classified as lean (body mass index (BMI)=21.8  $\pm$  2.9 kg/m<sup>2</sup>, n=5) or obese (BMI=48.2  $\pm$  8.9 kg/m<sup>2</sup>, n=12). The expression of RIP140 was analysed by Real-Time PCR and Western blot. Spearman's correlation coefficient ( $\rho$ ) was computed to explore the relation between RIP140 protein and anthropometric and biochemical variables.

**Results:** Gene expression levels of RIP140 were significantly lower (1.00  $\pm$  0.17 vs. 0.65  $\pm$  0.08 arbitrary units,  $P=0.045$ ) in obese patients compared to lean subjects. A similar pattern was observed at the protein level (1.00  $\pm$  0.55 vs. 0.61  $\pm$  0.30, a.u.), although no significant differences were observed ( $P=0.237$ ). Significant negative correlations of RIP140 were found with BMI ( $\rho=-0.68$ ,  $P=0.011$ ), body fat percentage ( $\rho=-0.65$ ,  $P=0.022$ ), leptin ( $\rho=-0.76$ ,  $P=0.004$ ), fibrinogen ( $\rho=-0.67$ ,  $P=0.023$ ) and C-reactive protein ( $\rho=-0.76$ ,  $P=0.010$ ) concentrations, while a significant positive correlation with HDL cholesterol levels ( $\rho=0.66$ ,  $P=0.050$ ) was detected.

**Conclusion:** Our data show that obese subjects exhibit lower RIP140 gene expression levels than lean subjects. This finding may represent a compensatory mechanism in order to improve energy expenditure and insulin sensitivity.

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## T1:PS.47

**Effects of green tea (-)epigallocatechin gallate supplementation on 3T3-L1 preadipocytes gene expression pattern**Larrarte, E<sup>1</sup>, Ares, R<sup>1</sup>, Labayen, I<sup>2</sup>, Simón, E<sup>2</sup>, Margareto, J<sup>1</sup><sup>1</sup>LEIA Foundation- Technological Development Centre, Vitoria, Spain<sup>2</sup>Department of Nutrition and Food Science, Basque Country University, Vitoria, Spain

**Objectives:** Green-tea catechins, especially EGCG, have been proposed as anti-obesity agents promoting apoptosis and inhibiting adipocyte growth and differentiation. Present work evaluates the effects of EGCG supplementation of 3T3-L1 cells on genome-wide gene expression changes.

**Methodology:** 3T3-L1 fibroblasts were cultured following standard procedures. Differentiation was induced with dexamethasone-insulin-isobutylmethylxanthine for 2 days, insulin for another 3 days and 10% FBS/DMEM for additional 5 days. Experiments were performed in duplicate at concentrations of 0 (0.1% DMSO) or 100  $\mu$ M EGCG for 10 days. At the end of experimental time RNA was isolated. Fluorescently labeled cDNAs were hybridized to Mouse-Oligoarray. Two samples per group were analysed by pooling RNAs. Reference design was followed to hybridized samples to microarrays. GeneSpring v7.3 was used for data normalizations and analysis.

**Results:** Expression of 189 genes was significantly different in EGCG-supplemented cultures as compared with non-supplemented controls. 75 genes were significantly downregulated with respect to non-supplemented preadipocytes, including genes involved in adipocyte differentiation and adipogenesis (Ddx5, Skp2), and genes related to inflammation (Crp) and ERK pathways (Appbp1). 114 genes were significantly upregulated such as genes related to cytoskeleton organization (Tuba1, Myo10, Tctex1, Actl7b, Arpc4), oxidative phosphorylation (Atp6v1d, Atp5k), protein biosynthesis (Surf4, Mrpl34, ribosomal proteins) and lysosomal lipid oxidation (Lamp1, PLD).

**Conclusions:** Utilization of DNA microarrays could contribute to the elucidation of mechanisms of action of EGCG and other compounds with potential effect against obesity. EGCG supplementation seems to affect adipocyte differentiation and inflammation related pathways. Additionally, EGCG may promote energy expenditure, lipid oxidation and cytoskeleton reorganization of adipocytes.

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## T1:PS.49

**Changes in cellular nitric oxide and enzymes regulating arginine during adipogenesis.**Ogston, NC<sup>1</sup>, Miheisi, N<sup>1</sup>, Hosseinzadeh-Attar, MJ<sup>1</sup>, Mohamed-Ali, V<sup>1</sup><sup>1</sup>University College London, London, United Kingdom

**Background:** Nitric oxide (NO) production and NO synthase (NOS) expression are increased in adipose tissue in obesity and NO may play a role in adipocyte function(s).

**Aims/Objectives:** We investigated changes in cellular NO and expression of genes regulating NOS substrate, L-arginine, in obesity and during adipogenesis in 3T3L1 cells in the presence of an endogenous NO inhibitor, asymmetric dimethylarginine (ADMA).

**Methods:** Adipose tissue mRNA from lean and diet-induced obese mice was extracted. Cell lysate, mRNA and culture supernatants were obtained at 0 (preadipocytes), 1, 2, 3, 4, 6, 7 and 8 days after induction of adipogenesis in 3T3L1s. NO was measured by Griess assay and expression of NOS, dimethylarginine dimethylaminohydrolase (DDAH) 1 & 2, argininosuccinate synthetase (ASS), argininosuccinate lyase (ASL) and arginase by real-time RT-PCR.

**Results:** DDAH (1&2), ASS and ASL mRNA were lower in obese adipose tissue (all  $p<0.05$ ). There was a significant decrease in NO at day 1, which then rose on days 2 and 3. However, NO levels in committed adipocytes were lower (days <3 versus days >4: 25.6[6.2] v 18.8[1.8] microM  $p<0.003$ ). Significant differences were not apparent in NOS, arginase, DDAH1 or ASS mRNA. But DDAH2 was higher in preadipocytes and ASL declined significantly at days 1 and 2 and then increased to levels similar to those in preadipocytes. ADMA generation was higher in adipocytes but exogenous ADMA (1mM) did not alter adipogenesis.

**Conclusions:** Dynamic changes in NO levels were apparent early in adipogenesis that may be mediated by enzymes regulating cellular L-arginine, rather than NOS. Research relating to this abstract was funded by the Wellcome Trust, Grant Numbers 070521/Z/03/Z and GR078055MA.

## T1:PS.50

Leptin replacement reverts muscular atrophy in *ob/ob* mice

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**Objective:** Absence of leptin has been associated with reduced skeletal muscle mass in leptin-deficient obese *ob/ob* mice. The aim of this study was to examine the effect of leptin on the catabolic and anabolic pathways regulating muscle mass in *ob/ob* mice.

**Methods:** Thirty wild type (W) and 30 *ob/ob* (O) mice were divided in 6 groups (n=10/group) by genotype and treatment [vehicle (V), pair-fed (F), and leptin (L)]. Control (WV, OV) and pair-fed (WP, OP) groups were injected intraperitoneally with PBS, while leptin-treated (WL, OL) groups received 1mg leptin/kg/d for 28 days. Gastrocnemius, soleus and EDL muscles were dissected out.

**Results:** Muscle mass of OV was significantly lower than WV ( $P<0.001$ ). Leptin treatment increased muscle mass of *ob/ob* mice as compared to OV and OP ( $P<0.001$ ). Furthermore, leptin increased the content of the contractile protein Troponin T (TnT) in gastrocnemius muscle of both genotypes, as evidenced by *slow*TnT ( $P=0.001$ ) and *fast*TnT ( $P=0.012$ ) isoforms by both immunoblot and immunohistochemistry. In addition, pair-fed groups showed higher content of the muscular atrophy marker atrogin-1 ( $P=0.014$ ), which was prevented by leptin in the skeletal muscle of both genotypes (immunoblot and immunohistochemistry). Furthermore, leptin induced an upregulation of PGC-1 $\alpha$  protein, a master regulator of mitochondrial biogenesis ( $P=0.005$ ).

**Conclusion:** Leptin replacement corrects muscular atrophy in *ob/ob* mice and prevents muscle loss induced by energy restriction in wild type and *ob/ob* mice by increasing troponin protein content, while decreasing proteolysis. Our study suggests that leptin treatment may be a new therapeutic strategy to prevent muscular atrophy associated with catabolic diseases.

**Funding:** Supported by Fundación Mutua Madrileña.

## T1:PS.52

## Simultaneous analysis of 3T3-L1 adipocyte methabolism by liquid chromatography mass spectrometry using stable isotope technique.

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**Introduction:** Adipocytes secrete a variety of cytokines/chemokines including tumor necrosis factor alpha (TNF-alpha), monocyte chemoattractant protein-1 (MCP-1), interleukin-6 (IL-6) and many more, and it has been suggested that these adipokines may play a role in the pathogenesis of health complications such as arteriosclerosis or type2 diabetes. It is important to control adipocyte methabolism for regulating adipocyte hypertrophy and adipocytokine secretion for therapy of life style related disease. But relations between adipocyte methabolism and hypertrophy or adipocytokine secretion are unknown. In this study, we developed simultaneous analysis system of 3T3-L1 adipocyte methabolism by liquid chromatography mass spectrometry by using stable isotope technique to explain adipocyte methabolism and adipocytokine secretion mechanism.

**Methods:** 3T3-L1 preadipocytes were differentiated for 10day, incubation with thiazolidinediones. After differentiation, medium were replaced by non-glucose DMEM added <sup>13</sup>C<sub>6</sub>-glucose, and incubated for 48h. Glucose, glycerol, fatty acids, and other organic acids of medium and cell lysate were analyzed by liquid chromatography mass spectrometry.

**Results:** We could develop quantitative analysis method to examine of adipocyte major methabolism, lipolysis, glucose-uptake, several fatty acid syntheses with high sensitivity by using stable isotope technique. In 3T3-L1 adipocyte, addition of pioglitazone made <sup>13</sup>C<sub>6</sub>-oleic acid and other mono unsaturated acid synthesis decreased dose-dependently, whereas addition of losiglitazone made them increased. It was suggested that thiazolidinediones not only activate glucose-uptake and fatty acid synthesis but also regulate fatty acid composition in 3T3-L1 adipocyte. Relations between fatty acids composition and adipocytokine secretion or hypertrophy of adipocytes are under examination by the described method.

## T1:PS.51

## Comparison of two indicators—waist circumference &amp; waist to hip ratio- to identify overweight/obesity in college student girls: ROC analysis

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**Introduction (Background & aims):** Obesity and central obesity are the most important predictors of non-communicable diseases. In this study two indicators—waist circumference & waist to hip ratio—were compared for identifying overweight/obesity in college student girls in the framework of the effectiveness of iron supplementation with and without vitamin C on oxidative stress markers project.

**Materials and Methods:** In this cross-sectional study, 289 college student girls from Shaheed Beheshti University of Medical sciences dormitories were enrolled voluntarily. Demographic data were obtained by questionnaire. Anthropometric data including height, weight, waist and hip circumferences were measured based on standard protocols and body mass index (BMI) and waist to hip ratio (WHR) were computed. Waist circumference (WC) above 88cm and WHR above 0.85 was considered as central obesity. SPSS software, chi-square test and ROC analysis were used for data analysis.

**Findings:** Mean of BMI, waist circumference and WHR in subjects studied were 22.2 $\pm$ 3.1 kg/m<sup>2</sup>, 74.4 $\pm$ 8.8 cm and 0.81 $\pm$ 0.46, respectively and increased with age ( $p<0.05$ ). 7.7, 77.4, 13.1 and 1.8% were underweight, normal weight, overweight and obese, respectively. Based on waist circumference, 7.3% and based on WHR, 35.2% of subjects had central obesity. More than 70% of central obese girls based on WHR were categorized in underweight (4.2%) and normal weight groups (67.7%); whereas, only 20% of central obese girls based on WC were categorized in normal weight group. None of the obese ones were included in without central obesity group. Area under ROC curves for identifying overweight/obesity based on WC and WHR were 0.92 $\pm$ 0.02 and 0.76 $\pm$ 0.04, respectively ( $p<0.001$ ). WC = 77 cm for identifying overweight in college student girls had better sensitivity (0.85) and specificity (0.75) than WHR = 0.79 (sensitivity = 0.70 and specificity = 0.69). Sensitivity of current WC cut off value (88cm) was very low (about 40%).

**Conclusion:** Sensitivity and specificity of waist circumference to identify overweight/obesity in college student girls was higher than WHR and therefore, WC is the better indicator for categorizing this age group based on weight status.

**Key words:** Waist circumference (WC), Waist to hip ratio (WHR), Overweight, Obesity, Central obesity, ROC analysis, College student girls

## T1:PS.53

## Adrenalectomy and oleoyl-estrone increase the circulating levels of progesterone and the expression of its receptors in liver

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Oleoyl-estrone (OE) is a natural hormone that reduces body weight in a dose-dependent manner through wasting of body fat (sparing protein) coupled to decreased energy intake. OE is counter-regulated by glucocorticoids since corticosterone prevents the OE-induced loss of lipids in adrenalectomized rats, partly by increasing both hepatic 11 $\beta$ -hydroxysteroid dehydrogenase type 1 and free circulating glucocorticoid, through modulation of serum CBG binding. To study changes in steroid hormones and the receptors implied in glucocorticoid action, female adrenalectomized Wistar rats were implanted with subcutaneous pellets of placebo, 0.48, 1.67, or 4.76 mg/day of corticosterone; 5 days later, all rats received a daily gavage of sunflower oil, plain or containing OE at a dose of 10nmol/g for additional 8 days. A group of sham-operated rats was used as control of surgery. The expression of the receptors for glucocorticoids, mineralocorticoids and progesterone A and A+B in liver were analyzed by Real-Time PCR and corticosterone, dehydrocorticosterone and progesterone in serum were measured by HPLC-MS/MS. Levels of corticosterone and dehydrocorticosterone increased with the dose of corticosterone in pellets with no effects of OE. Progesterone was higher in all OE-treated rats, corticosterone not affecting its levels. OE increased the expression of glucocorticoid and both progesterone receptors in sham-operated and in adrenalectomized rats treated with corticosterone. Corticosterone alone did not change progesterone receptor expression and affected in a biphasic way receptors of mineralocorticoids and glucocorticoids. In conclusion, OE enhanced both glucocorticoid and progesterone signalling in liver through the increased expression of its receptors and availability of the hormones.

T1:PS.54

**Prevalence of obesity and overweight school children in hradec kralove in czech republic**

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**Background:** The prevalence of childhood overweight and obesity is increasing at an alarming rate in the USA as well as in other developed and developing countries. Obesity is linked to serious complications in childhood and an obese child is at risk of becoming an obese adult.

Trends are, however, difficult to quantify or to compare internationally, as a wide variety of definitions of child obesity are in use, and no commonly accepted standard has yet emerged.

**Methods:** The aim of this study was undertaken to define the prevalence of being overweight or obese in a population of children 8–14 years of age, living in Hradec Kralove Czech Republic. The target population was elementary school children in 2<sup>nd</sup>, 4<sup>th</sup>, 6<sup>th</sup> and 8<sup>th</sup> grade. All clinical assessments including anthropometric measures were obtained annually by centrally trained examiners using a common protocol. The prevalence of overweight and obese was assessed using the 1991 Czech references values (risk for overweight by BMI-for-age of 90 to 97<sup>th</sup> percentile and obese up to 97<sup>th</sup> percentile).

**Results and conclusion:** In-group of 738 school children was 22 % obese and 17% overweight children. From results is shown that at the village the children are more obese (29%) than at town (22%). The prevalence of overweight show similar trend (village – 18%, town - 15%). In group of gender are more obese girls (22%) than boys (21%) and overweight the higher prevalence is in group of boys (19%) than girls (15%).

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T1:PS.56

**Fat distribution according to Kir6.2 E23K polymorphism in Koreans**

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**Background:** Obesity is caused by interactions of energy consumption, amount of food intake, physical activity and etc, and these elements are influenced by genetic factors. Obesity related genes which have been known by now are over 200. One of these is Kir6.2 which forms the pore region of KATP channel, and genetic variation of which may result in altered -cell electrical activity, insulin secretion, glucose homeostasis, and increased susceptibility to type 2 diabetes. Therefore, the purpose of this study was to examine the relationship between Kir6.2 E23K polymorphism and fat distribution and metabolic profiles in Korean.

**Method:** A total of 164 patients who visited Dongsan Medical Center Obesity Clinic from February 2004 to December 2005, were enrolled in this study. Screening for Kir6.2 polymorphism carried out by PCR-RFLP analyses. We divided this group into three groups E/E, E/K, K/K. Serum lipid profile and blood glucose level were measured. Visceral fat amount and subcutaneous fat by abdominal CT, total fat mass by DEXA were measured.

**Results:** Genotype frequencies of E/E, E/K, K/K polymorphism were 24 (14.6%), 79 (48.2%), 61 (37.2%) each. K/K subjects groups have more visceral fat amount(P<0.05) and higher total cholesterol levels(P<0.05) than E/E subjects group(visceral fat amount; 136.6±66.98 cm<sup>2</sup> vs 96.4±51.31 cm<sup>2</sup>, total cholesterol 205.8±51.64 mg/dl vs 175.6±41.08 mg/d).

**Conclusion:** Visceral fat amount and serum total cholesterol were significantly different according to Kir6.2 E23K polymorphism. Therefore, Kir6.2 polymorphism may act on fat distribution in Koreans.

T1:PS.55

**Obesity and immune activation - the 5 – year follow – up study**

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**Objective:** The aim of the present study was to determine changes in body mass and immune activation in lean, overweight and obese women during 5 – year prospective observation.

**Material and methods:** 5 – year prospective observation of 14 healthy, normal-weight (age 41.4 ± 8.0 y), 12 overweight (age 38.3 ± 11.9 y) and 57 obese (48.8 ± 10.8 y) subjects without additional diseases was performed. Body mass, composition and waist circumference were measured. Serum concentrations of TNF-α, sTNFRs and NO metabolites were determined by ELISA method, insulin by RIA and glucose by colorimetric methods at the baseline and after 5 years.

**Results:**

	Lean		Overweight		Obese	
	baseline	after	baseline	after	baseline	after
Body mass (kg)	59.8±7.0	61.9±7.2	77.4±7.6	76.5±10.4	95.2±14.8	103.4±15.9**
BMI (kg/m <sup>2</sup> )	22.3±2.1	23.1±2.7	28.2±1.7	27.7±2.9	36.2±4.6	39.0±4.5
Body fat (kg)	14.8±3.7	20.6±5.4**	27.7±4.9	28.1±6.5	42.3±11.9	52.3±12.6 **
Waist circumference (cm)	69.9±6.3	78.4±9.6**	90.8±10.0	90.0±8.4	107.8±11.7	115.8±11.1**
Glucose (mmol/l)	4.9±0.5	5.1±0.8	4.7±0.4	5.4±0.8**	5.0±0.7	5.7±1.3**
Insulin (μU/ml)	8.6±4.0	6.7±3.3	14.8±6.5	6.5±7.0**	17.3±8.1	11.9±8.4**
HOMA	1.9±0.9	1.6±0.9	3.1±1.4	1.7±2.3	3.9±2.1	3.3±3.5
TNF - α (pg/ml)	3.1±3.0	5.6±2.0 **	6.3±3.0	6.4±4.9	6.9±2.9	6.0±2.4
sTNFR1 (pg/ml)	1141.4±99.9	1502.4±468.1*	1156.6±145.7	2333.9±477.7*	1264.2±202.7	2103.7±564.9**
sTNFR2 (pg/ml)	1695.3±377.4	2123.0±437.9*	1899.3±581.2	2242.6±505.7	1911.7±563.5	2223.7±455.0*
NO metabolites (μmol/l)	26.8±6.7	28.4±7.7**	32.9±7.5	28.6±8.6**	33.7±10.1	32.8±9.5

\* p < 0.05; \*\* p < 0.00001

**Conclusion:** Fat mass increase causes increase of TNF - α, sTNFRs and NO metabolites concentrations in lean subjects. However, further fat mass gain in obese women is only a cause of increase in sTNFRs levels.

T1:PS.57

**Lipoic acid increases lipolysis in fully differentiated 3T3-L1 cells**

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**Introduction:** Lipoic acid is an antioxidant molecule with potential beneficial effects on fuel metabolism and obesity. The aim of the present study was to investigate whether the putative antiobesity actions of lipoic acid could be due to direct lipolytic actions.

**Methods:** Fully differentiated 3T3-L1 adipocytes were treated with different lipoic acid amounts (1-500 μM) and/or hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>) at two concentrations (0.2 and 0.5 mM) for 24 hours. Lipolysis was evaluated by the glycerol release into the media. The expression levels of three genes involved in lipolysis: HSL, adiponutrin and desnutrin/adipose triglyceride lipase (ATGL) were determined by real-time PCR and normalized with respect to the 18S ribosomal mRNA levels.

**Results:** Glycerol release was significantly increased (P<0.01) by lipoic acid at the highest concentrations used (+80.5% for 250 μM and +154.5% for 500 μM) whereas H<sub>2</sub>O<sub>2</sub> alone did not show any effect on glycerol release. Furthermore, the stimulatory effect of lipoic acid on lipolysis was less potent when cells were co-treated with lipoic acid and H<sub>2</sub>O<sub>2</sub>. Surprisingly, lipoic acid (250-500 μM) inhibited the gene expression of the three lipases analyzed (P<0.05- P<0.01) while H<sub>2</sub>O<sub>2</sub> alone did not show any effect.

**Conclusions:** These results suggest that the increased lipolysis induced by lipoic acid could be involved, at least in part, in the potential antiobesity actions previously described for this antioxidant. However, the specific mechanism by which lipoic acid stimulates lipolysis remains to be determined.

**Funding:** this study was supported by the Spanish Government (AGL2006-04716/ALI)

## T1:PS.58

**Effect of aerobic training on atrial natriuretic peptide and catecholamine-induced lipolysis in obese women with polycystic ovary syndrome**

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We investigated the effect of polycystic ovary syndrome (PCOS) on the regulation of lipolysis by atrial natriuretic peptide (ANP) and catecholamine before and after 16-weeks of aerobic training.

Eight hyperandrogenic women with PCOS (age 25±1y, BMI 32.0±1.6 kg/m<sup>2</sup>) and eight healthy matched-control women were included in the study. We evaluated *in vitro*, 1) the effect of PCOS on ANP- and catecholamine-induced lipolysis, 2) the effect of 16-weeks of aerobic training on the regulation of lipolysis in PCOS. Lipolysis was investigated in isolated subcutaneous abdominal adipocytes.

Baseline and maximal hormone-induced lipolysis was markedly reduced in PCOS women. The lipolytic sensitivity to ANP and isoproterenol was 5- and 4-fold lower, respectively in PCOS women. Interestingly, baseline ( $p < 0.001$ ), ANP- ( $p < 0.01$ ) and isoproterenol- ( $p < 0.001$ ) mediated lipolysis was remarkably increased after training independently of changes in body weight and sex hormones (free testosterone and SHBG). The lipolytic sensitivity of ANP was significantly improved ( $EC_{50}$  2.83 vs. 0.26 nM before and after training respectively,  $p < 0.05$ ), while the effect of the postreceptor-acting agent 8-bromo-cGMP (activating PKG) was unchanged. Conversely, the lipolytic sensitivity of isoproterenol remained unaffected by the intervention while its maximal lipolytic effect increased (1.4-fold,  $p < 0.05$ ) together with the effect of dibutyryl-cAMP (activating PKA) (2.1-fold,  $p < 0.001$ ).

Altogether, these data show that ANP- and catecholamine-induced lipolysis is impaired in PCOS women. These lipolytic defects can be partly recovered through distinct mechanisms by aerobic training independently of changes in body weight and sex hormones.

## T1:PS.60

**Organ-specific response to high-fat diet and 3,5-diiodothyronine (T2) treatment; a possible involvement of the AMP-activated protein kinase (AMPK).**De Lange, P<sup>1</sup>, Senese, R<sup>1</sup>, Moreno, M<sup>2</sup>, Lombardi, A<sup>3</sup>, Silvestri, E<sup>2</sup>, Cioffi, F<sup>1</sup>, Goglia, F<sup>2</sup> and Lanni, A<sup>1</sup><sup>1</sup>Dip. Scienze della Vita, Seconda Università degli Studi di Napoli, Caserta, Italy<sup>2</sup>Dip. delle Scienze Biologiche ed Ambientali, Università degli Studi del Sannio, Benevento, Italy<sup>3</sup>Dip. Scienze Biologiche Sez. Fisiologia, Università degli Studi di Napoli "Federico II", Napoli, Italy

3,5-diiodo-L-thyronine (T2) prevents body weight-gain and fat accumulation when administered to rats receiving a high-fat diet (HFD). It induces an increase in hepatic fatty acid (FA) oxidation concomitant to their less efficient utilization. The effects of T2 on fatty acid oxidation involve the AMP-activated protein kinase (AMPK), but it is not clear how its modulation is achieved in tissues such as liver and white adipose tissue (WAT). Three groups of rats were used, either receiving a 6 hour, 1 day, 1-week or 4-week high fat diet with (group HFD-T2), or without (group HFD), a daily i.p. injection of T2 (25 µg/100 g BW), or a standard diet for the same periods (group N).

Within 6 hours, T2 increased liver FA oxidation without induction of AMPK phosphorylation. Only after 4 weeks the HFD-T2-treated rats showed a marked increase in liver AMPK phosphorylation. In WAT, between 1 day and 1 week, T2 induced an decrease in AMPK phosphorylation compared to the HFD rats, concomitant with an increase in lipolysis and serum fatty acid levels, which ceases after 4 weeks, possibly because WAT cell volume reached a minimum. At this time-point hepatic lipids were barely present and serum lipids were not increased compared to N controls. In conclusion, treatment with T2 increases hepatic FA utilization which does not depend on AMPK phosphorylation in this tissue, but decreases AMPK phosphorylation in WAT, resulting in increased lipolysis. As fatty acid oxidation proceeds, liver AMPK is phosphorylated as a consequence of hepatic fuel-depletion.

## T1:PS.59

**Beta-cell function compensation of impaired insulin sensitivity in former gdm obese women with normoglycemia**Tura, A<sup>1</sup>, Pacini, G<sup>1</sup>, Mari, A<sup>1</sup>, Pricoszovich, T<sup>2</sup>, Winnhofer, Y<sup>2</sup>, Kautzky-Willer, A<sup>2</sup><sup>1</sup>Institute of Biomedical Engineering, CNR, Padua, Italy<sup>2</sup>Clinic of Internal Medicine III, Medical University of Vienna, Austria

Former gestational diabetic (fGDM) women with normal glycaemia present insulin resistance and mild beta cell dysfunction. The possible further effect of obesity has not been fully investigated, especially in terms of beta-cell function.

**Aim:** to assess beta-cell function in fGDM obese compared to fGDM lean women. **Subjects:** 26 fGDM obese (OBS; 32±1 yrs (mean±SE), BMI=31.0±0.8 kg/m<sup>2</sup>, fasting glucose=4.8±0.08 mM, 2h-glucose=6.1±0.16 mM) and 49 fGDM lean subjects with similar glycaemia were studied (CNT; 33±1 yrs, BMI=23.3±0.3 kg/m<sup>2</sup>, fasting 4.7±0.05 and 2h-glucose 5.8±0.16 mM). Basal insulin was higher in OBS (77.4±9.5 vs. 41.1±2.1 pM,  $P < 0.01$ ).

**Methods:** Insulin sensitivity and beta cell function were assessed from 75g 3h-OGTT with validated mathematical models. Beta-cell parameters from C-peptide deconvolution were basal insulin secretion rate,  $ISR_b$ , total insulin secretion, TIS, and Glucose Sensitivity (slope of the glucose dose/beta-cell response function).

**Results:** Insulin sensitivity (OGIS) was lower in OBS (416±11 vs. 463±7 ml·min<sup>-1</sup>·m<sup>-2</sup>,  $P < 0.001$ ).  $ISR_b$  and TIS were higher in OBS (105±9 vs. 67±3 pmol·min<sup>-1</sup>·m<sup>-2</sup> and 67±5 vs. 54±2 nmol·m<sup>-2</sup>,  $P < 0.01$ ) and inversely related to insulin sensitivity, with OBS showing tendency towards increased response. Glucose Sensitivity was not related to insulin sensitivity as expected from previous studies and was similar in the two groups (124±11 vs. 112±7 pmol·min<sup>-1</sup>·m<sup>-2</sup>·mM<sup>-1</sup>,  $P > 0.2$ ).

**Conclusion:** In fGDM obese subjects insulin secretion compensates for reduced insulin sensitivity (increased  $ISR_b$  and TIS) though compensation does not involve sensitivity to glucose of the beta-cells. Thus, fGDM obese women have greater insulin resistance compared to lean women, but not beta-cell function impairment.

**Funding:** Supported in part by the Austrian Nationalbank Jubiläumsfonds grant 11198.

## T1:PS.61

**The presence of white adipose tissue is necessary for insulin sensitizing effects of angiotensin converting enzyme inhibition: studies on mice with diet-induced obesity and fatless A-ZIP/F-1 mice**Haluzik, M<sup>1</sup>, Kavalkova, P<sup>1</sup>, Bartlova, M<sup>1</sup>, Haluzik, MM<sup>1,2</sup>, Lacinova, Z<sup>1</sup>, Haluzikova, D<sup>1</sup><sup>1</sup>Faculty of Medicine and General University Hospital, Charles University, Praha, Czech Republic<sup>2</sup>Department of Chemistry, University of Ostrava, Ostrava, Czech Republic

We studied the metabolic effects of angiotensin converting enzyme (ACE) - inhibitor ramipril in lipoatrophic A-ZIP/F-1 mice which lack white adipose tissue and in C57BL/6J mice with high fat diet (HFD) - induced obesity and insulin resistance. 3-months treatment with ramipril (8 mg/kg in the food) did not significantly affect blood glucose, serum insulin, triglycerides or free fatty acids in A-ZIP mice. In contrast, in HFD-fed mice, ramipril treatment partially prevented the increase of body fat content, decreased adipocyte size, free fatty acids and triglyceride levels and improved insulin sensitivity as measured by insulin concentrations and HOMA index. In subcutaneous fat, ramipril treatment prevented a drop of adiponectin mRNA expression induced by HFD and tended to decrease the mRNA expression of macrophage marker Emr1 and TNF- mRNA. In visceral adipose tissue, ramipril prevented a decrease of adiponectin mRNA expression induced by HFD, significantly blunted increased Emr1 and MCP-1 and tended to decrease interleukin-6 and TNF-mRNA expression.

In summary, our data suggest that ACE inhibition by ramipril partially prevented the development of obesity and insulin resistance in mice fed HFD while it did not affect insulin sensitivity in fatless A-ZIP mice. The mechanism of action of ramipril may lie in the increase of adiponectin production in adipose tissue together with the suppression of fat infiltration by macrophages and the amelioration of development of local inflammation in adipose tissue.

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## T1:PS.62

**Amylin levels in the brain influence the level of body weight maintenance implying that amylin acts as adiposity signal**Wielinga, PY<sup>1</sup>, Muff, S<sup>1</sup>, Woods, SC<sup>2</sup>, Lutz TA<sup>1</sup><sup>1</sup> Institute of Veterinary Physiology, Vetsuisse Faculty University of Zurich, Switzerland<sup>2</sup> Department of Psychiatry, University of Cincinnati, Cincinnati, OH, USA

Besides being a satiation signal, amylin may also act as adiposity signal, i.e. inform the brain about the status of peripheral energy stores. The aim of this study is to further investigate amylin's role as adiposity signal. Two groups of rats received either a 14 day chronic intra-third ventricle infusion of amylin (2 pmol/h) or saline, were fasted for two days and then refed ad libitum. Two additional groups (amylin or saline) were fed ad libitum (AL) continuously. Both fasted groups lost 39g due to fasting. Amylin-AL rats lost 21g in 3 days. After refeeding, saline-fasted rats regained bw and maintained bw to the same level as saline-AL rats. Amylin-fasted regained bw and maintained bw at the same level as amylin-AL, which was significantly lower than saline treated rats. This indicates that central levels of amylin influence the bw to be maintained. The setup of the second experiment was similar, but before infusion with amylin or saline, half of the rats were overfed for 3 weeks with Ensure<sup>®</sup> to increase their bw about 60g more than chow-fed rats. After implantation of minipumps, all rats received chow only. Amylin-chow significantly lost body weight compared to saline-chow. Surprisingly, amylin-overfed maintained bw to the same level as the saline rats, suggesting amylin insensitivity. Taken together, these data do provide support for amylin to act as adiposity signal. However, after exposure to high energy diet Ensure<sup>®</sup>, rats appeared to develop an insensitivity to central amylin infusion. The reason for this is currently under investigation.

## T1:PS.64

**Exercise modulates amp kinase activity in the Hypothalamus of wistar rats**Fernandes, M F A<sup>1</sup>, Flores, M<sup>1</sup>, Ueno, M<sup>1</sup>, Ropele, E<sup>1</sup>, Saad, M J A<sup>1</sup>, Carvalheira, J B C<sup>1</sup><sup>1</sup> Universidade Estadual de Campinas (UNICAMP) – Faculdade de Ciências Médicas, Campinas/SP, Brasil

AMP-activated protein kinase (AMPK) and mammalian Target of Rapamycin (mTOR) are key regulators of cellular energy balance and of the effects of leptin on food intake. Acute exercise is associated with increased sensitivity to the effects of leptin on food intake in an IL-6-dependent manner. To determine whether exercise ameliorates the AMPK and mTOR response to leptin in the hypothalamus in an IL-6-dependent manner, rats performed two 3-h exercise bouts, separated by one 45-min rest period. Intracerebroventricular IL-6 infusion reduced food intake and pretreatment with AMPK activators and mTOR inhibitors prevented IL-6-induced anorexia. Activators of AMPK increased food intake in control rats to a greater extent than that observed in exercised ones, whereas inhibitors of AMPK had the opposite effect. Exercise was associated with both reduced phosphorylation of the AMPK/ACC signaling pathway and increased phosphorylation of proteins involved in mTOR signal transduction in the hypothalamus. Treatment with leptin reduced food intake in exercised rats that were pretreated with vehicle, although no increase in sensitivity to leptin-induced anorexia after pre-treatment with anti-IL6 antibody, AICAR or Rapamycin was detected. Thus, improved responses of AMPK and mTOR to leptin may contribute to the appetite suppressive actions of exercise.

## T1:PS.63

**The association of desaturase 9 (Δ9) and fasting plasma fatty acid composition with adiposity and insulin resistance associated factors in female adolescents**Zhou, Y<sup>1</sup>, Kubow, S<sup>1</sup>, Melzter SJ<sup>2</sup>, Egeland, G<sup>1</sup><sup>1</sup>School of Dietetics and Human Nutrition, McGill University, Montreal, Canada<sup>2</sup>Division of Endocrinology and Metabolism, Royal Victoria Hospital, Montreal, Canada

Animal studies suggest that fatty acids influence insulin resistance and that adiposity influences the Δ9 which converts saturated fatty acids (SFA) into monounsaturated fatty acids and the blood fatty acid profile. Fasting plasma and anthropometric measures from 180 healthy female adolescents were used to determine whether Δ9 has independent associations with these factors and whether the association between the fasting plasma fatty acid profile and insulin resistance level are independent of abdominal obesity level.

Δ9-16 (C16:1n7/C16:0) correlated with waist girth (r=.160, p<.05), HOMA (r=.201, p<.01), plasma polyunsaturated fatty acids (PUFA) [e.g., C20:4n6 (r= -.269, p<.001), C22:6 n3 (r= -.274, p<.001)]. After adjustment for dietary SFA, Δ9-16 had stronger correlation with waist (r=.227, p<.01) and significant correlation with PUFA, whereas it had a non-significant correlation with HOMA. The same pattern was observed with Δ9-18 (C18:1n9/C18:0). After adjustment for dietary SFA, waist and HOMA, Δ9-16 and Δ9-18 were still positive predictors of triglyceride (both P<.001) and ApoB (Δ9-18, P<.001; Δ9-16, P=.052). After adjustment for waist, HOMA only remained a positive determinant of median chain SFA [C14:0, P<.001; C16:0, P<.05], but it emerged to be inversely related to C20:4n6 (P<.01).

We conclude: Δ9 is under regulation of multiple factors, and its role in maintaining energy homeostasis is via an insulin independent path regulated by adipose tissue derived hormone(s); the positive and independent associations of median chain SFAs with insulin resistance level suggest their vital roles in diabetes pathogenesis, while certain PUFA such as C20:4n6 appears to be protective.

## T1:PS.65

**Early changes following bariatric surgery in South Africa**Logan, M<sup>1</sup>, Pepper, MS<sup>1</sup>, van der Merwe, MT<sup>2</sup><sup>1</sup> Molecular and Metabolic Medicine Research Group, University of Pretoria, Pretoria, South Africa<sup>2</sup> Department of Endocrinology, UP

**Aim:** To provide a descriptive analysis of a retrospective study on a typical cohort of patients undergoing bariatric surgery in South Africa in the Bariatric Centres of Excellence setting.

**Materials and methods:** 330 patients (2005-2007) with a mean BMI of 45.87 ± 0.63 (mean ± SEM) were characterised pre-operatively (PRE) with regard to clinical, anthropometric and DEXA measurements. 130 were matched for the same parameters post-operatively (POST) over a 9-12 month observation period. The data was analysed statistically using paired t-tests and regression analyses.

**Results:**

Parameter	PRE	POST	
		≤ 3 months	≥ 3 months
Fasting Glucose mmol/L	5.4 ± 0.1	5.14 ± 0.08 **	4.85 ± 0.1 ****
Cholesterol mmol/L	5.18 ± 0.095	4.45 ± 0.098 ****	4.51 ± 0.12 ****
Triglyceride mmol/L	1.73 ± 0.11	1.39 ± 0.06 ***	1.36 ± 0.11 ***
HDL mmol/L	1.15 ± 0.036	1.11 ± 0.03 **	1.21 ± 0.06
LDL mmol/L	3.42 ± 0.08	2.8 ± 0.09 ****	2.83 ± 0.11 ****
GGT U/L	34.6 ± 2.24	28.02 ± 2.12 *	22.31 ± 2.1 ****
Waist cm	136.83 ± 2.65	117.75 ± 2.19 ****	114.3 ± 3.29 ****
Hip cm	148.41 ± 2.02	131.33 ± 2.2 ****	126.3 ± 4.04 ****
Weight kg	137.01 ± 3.4	117.64 ± 3.82 ****	110.4 ± 5.2 ****
BMI kg/m <sup>2</sup>	48.2 ± 1.16	41.61 ± 1.4 ****	39.1 ± 1.92 ****
BP systolic mmHg	144.08 ± 1.75	131.15 ± 1.25 ****	136.1 ± 2.53
BP diastolic mmHg	87.98 ± 1.24	79.43 ± 1.1 ****	81.95 ± 1.6

\*p &lt; 0.05; \*\*p &lt; 0.01; \*\*\*p &lt; 0.005; \*\*\*\*p &lt; 0.001

Patients were assessed according to a South African standardized pre-op risk factor score to determine eligibility for surgery. Mean percentages of scoring were (total - [47.22%] history - [51.0%] clinical parameters - [77.3%] and special investigations - [36.4%]).

**Conclusion:** Average post-op weight loss at first follow-up was 14% of initial pre-op weight. Co-morbid diseases and anthropometric measurements illustrated significant changes following surgery. Risk factor scoring is a valuable pre-op tool for assessing eligibility.

**Funding:** Bariatric Centres of Excellence, UNITAS hospital, Pretoria, South Africa.

## T1:PS.66

**Insulin resistance, beta-cell function and glycemic status in overweight/ obese patients**Silva-Nunes, J<sup>1</sup>, Duarte, L<sup>1</sup>, Malheiro, F<sup>1</sup><sup>1</sup>Endocrinology Department-Curry Cabral Hospital, Lisbon, Portugal

**Background and aims:** Insulin resistance (IR) and diminished beta-cell function (f-BETACell) are phenomena involved in carbohydrate dysmetabolism. Our objective was to correlate age and anthropometric parameters with several indexes of IR and f-BETACell and to compare them according to glycemic status, in overweight/obese patients.

**Methods:** We characterized anthropometrically 346 overweight/obese patients (61 men). An oGTT was performed and patients were classified for glycemic status. We considered 2 indexes of f-BETACell (Insulinogenic Index –INS-i and HOMA-BetaCell) and 4 for IR (HOMA-IR, Matsuda formula –MATSUDA, QUICKI and McAuley index –McAULEY).

**Results:** Patients were characterized by mean age=38±13 years, BMI=36.9±6 Kg/m<sup>2</sup>, Waist circumference = 106.4±13.9 cm, INS-I = 28.3±49.5, HOMA-BetaCell=273.3±260.1, HOMA-IR=3.26±2.38, MATSUDA=3.47±1.91, QUICKI=0.14±0.01 and McAULEY=6.73±1.59. The majority of patients (73.7%) had normoglycemia, 9.5% impaired glucose tolerance, 9.5% impaired fasting glucose and 7.3% were diabetic. Except for INS-i, we verified a significant difference between groups for all other parameters (p=0.000, for all). There was a significant difference (p=0.000) in glycemic status by weight grade (overweight and obesity class I, II and III). Age was inversely associated with INS-i (p=0.04; r=-0.149) and HOMA-BetaCell (p=0.000; r=-0.358). BMI directly correlates with HOMA-IR (p=0.000; r=0.381) and inversely with QUICKI (p=0.000; r=-0.390), MATSUDA (p=0.000; r=-0.382) and McAULEY (p=0.000; r=-0.36); the same occurred with waist circumference (p=0.000; r=0.345, p=0.000; r=-0.396, p=0.000; r=-0.442 and p=0.000; r=-0.426, respectively). All IR indexes were interrelated (p=0.000; 0.638<r<0.864); HOMA-BetaCell didn't correlate with INS-i.

**Conclusion:** In overweight/obese patients, age is a key conditioning factor of beta-cell function. However, IR is the most important phenomenon related with carbohydrate dysmetabolism.

## T1:PS.68

**Oxidative status and homocysteine metabolism in occupational obese subjects**Vigna L.<sup>1</sup>, Novembrino C.<sup>2</sup>, Tirelli A.S.<sup>3</sup> L. Riboldi<sup>1</sup>, Torresani E.<sup>3</sup>, Bamonti F.<sup>2</sup><sup>1</sup>Dipartimento Medicina Preventiva Clinica e del Lavoro, U.O. Medicina del Lavoro I, Ospedale Maggiore Policlinico, Mangiagalli e Regina Elena, Fondazione IRCCS, Milano, Italy.<sup>2</sup>Dipartimento di Scienze Mediche, Università degli Studi di Milano, Ospedale Maggiore Policlinico, Mangiagalli e Regina Elena, Fondazione IRCCS, Milano, Italy.<sup>3</sup>Laboratorio Patologia Clinica, Dipartimento Area Servizi Diagnostici, Ospedale Maggiore Policlinico, Mangiagalli e Regina Elena, Fondazione IRCCS, Milano, Italy.

Subjects with central deposition of adipose tissue show elevated cardiovascular morbidity and mortality. The pathogenic mechanisms leading to endothelial dysfunction could be due to Oxidative Stress, OS, (imbalance between Reactive Oxygen Species, ROS, and Total Antioxidant Capacity, TAC), and hyperhomocysteinemia (HHcy), probably due to vitamin metabolism imbalance. Possible early vitamin B12 (B12) deficiency can be highlighted by holotranscobalamin, HoloTC, (bioactive cobalamin fraction), assay.

To evaluate OS and homocysteine (Hcy) metabolism, an observational study was performed on 50 occupational obese subjects (12M/38F, aged 20-65, median 47 years; BMI 27.3-45, median 34.8 Kg/m<sup>2</sup>; without traditional cardiovascular risk factors). Serum TAC and ROS levels were measured by spectrophotometric methods (Diacron International, Italy), serum B12 and HoloTC, serum and erythrocyte folate, plasma Hcy concentrations by immunoenzymatic methods (AxSYM, Abbott Diagnostics, USA), lipid panel and inflammatory parameters by routine methods.

Data are expressed as median and IQR and analysed using Pearson's correlation coefficient.

Forty % of cases showed mild HHcy (12.5 micromol/L, 11.5-16.0). All subjects showed adequate serum and erythrocyte folate levels, but HoloTC values revealed cobalamin deficiency in 22% of cases not congruent with B12 concentrations low only in 8%. Study population showed OS having normal mean TAC values (383 micromolHClO/mL, 359-415; reference value >350) but increased mean ROS concentrations (408 UCarr, 366-458; reference interval 250-300) in 92% of subjects. A significant (p=0.05) positive correlation was found between ROS and C Reactive Protein.

Our results showed that obesity possibly increases the prevalence of HHcy, OS, and inflammation heightening the effects of classical risk factors.

## T1:PS.67

**Phosphodiester content in skeletal muscle of overweight patients with Type 2 Diabetes mellitus relates to body weight and insulin sensitivity.**Szendroedi J<sup>1,2</sup>, Schmid A.<sup>2,3</sup>, Chmelik M<sup>2,3</sup>, Toth C<sup>2</sup>, Brehm A<sup>4</sup>, Krssak M<sup>1</sup>, Nowotny P<sup>1</sup>, Wolz M<sup>1</sup>, Waldhäusl W<sup>1</sup>, Roden M<sup>2,4</sup><sup>1</sup>1. Medical Department, Hanusch Hospital, Vienna, Austria <sup>2</sup>Karl-Landsteiner Institute of Endocrinology and Metabolism, Vienna, Austria, <sup>3</sup>MR centre of excellence, Medical University of Vienna, Vienna, Austria, <sup>4</sup> Department of Internal Medicine 3, University of Vienna, Vienna, Austria

The membrane composition of skeletal muscle has been related to insulin action. Possible mechanisms suggested include changed membrane fluidity, which could affect insulin receptor activation, release of different second messenger molecules influencing cellular processes, and altered cellular energy expenditure influencing lipid stores. However, the factors determining muscle phosphodiester concentrations are yet unclear. Glucose metabolism, ectopic lipid deposition in muscle (IMCL) and mitochondrial function were measured in 10 overweight type-2 diabetic patients (T2DM: age:59±6 a, BMI: 27±3 kg/m<sup>2</sup>), 10 sex-/age-/body mass-matched elderly (CONo: 57±6 a, 26±3 kg/m<sup>2</sup>) and 11 younger controls (CONy: 27±2 a, 23±2 kg/m<sup>2</sup>). Phosphodiester content (PDE), ATP synthetic flux (fATP) and IMCL were assessed with <sup>31</sup>P/H magnetic resonance spectroscopy, insulin sensitivity was determined via hyperinsulinemic-euglycemic clamp tests (M-value). PDE was ~31% lower in CONy than in overweight CONo and T2DM (T2DM: 2.8+/-0.2, CONo: 2.5+/-0.2, CONy: 1.8+/-0.1 mmol/l, P=0.002) despite comparable muscle lipid contents. M was lower in diabetic patients (-35% vs. CONo, -56% vs. CONy; P<0.05). T2DM had ~37% lower fATP than CONy (8.6±2 vs. 11.8±3 μmol.g<sup>-1</sup> muscle.min<sup>-1</sup>; P <0.05, CONo (10.4±3). PDE related negatively to M (r=-0.620, P<0.001) and fATP (r=-0.371, P<0.05), and positively to age (r=0.610, P<0.001), BMI (r=0.672, P<0.001), HbA1c (r=0.672, P<0.001) and fasting plasma glucose (r=0.614, P<0.001), but did not relate to IMCL. PDE content of skeletal muscle strongly relates to insulin resistance, is increased in elderly and obese and does not depend on intramyocellular lipid contents.

## T1:PS.69

**Gut microbiota modulation by non-absorptive antibiotics polymyxin B and neomycin improved glucose tolerance in DIO mice**

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Gut microbiota has been shown to influence adiposity. However it is not clear whether gut microbiota is involved in the pathophysiology of type 2 diabetes. To address this issue, we modulated gut microbiota via antibiotic treatments and examined the diabetic phenotypes of diet-induced obese and insulin resistant (DIO) mice immediately after the treatments and after a 4-week washout period. Our data demonstrate that 2-week treatment with polymyxin B/neomycin (0.5 and 1.0 g/L) significantly altered the cecal microbiota profile and reduced the number of cecal Enterobacteria. The blood glucose concentration was also reduced by 6.2% in the treated DIO mice. Norfloxacin/ampicillin treatment (1.0 g/L each) drastically reduced cecal bacterial DNA concentrations below the limit of detection resulting in enhanced glycemic control with a 15.8% reduction in glycemia and improved glucose tolerance in the DIO mice. After the 4-week washout period, the pattern of cecal microbiota was similar to that observed at the end of antibiotic treatments, regardless of the combination of antibiotics. However, the beneficial effect of norfloxacin and ampicillin was restricted to a lowered fasting glycemia, while the mice previously treated with polymyxin B/neomycin showed further improvements in fasting glycemia and oral glucose tolerance. The continuous improvement in glycemic control was associated with the modulated intestinal microbiota rather than the food intake, body weights or body fat of the mice. In summary, our data indicate that treatment with the non-absorptive antibiotics polymyxin B/neomycin ameliorated glycemic control of DIO mice through a mechanism involved in gut microbiota modifications.

## T1:PS.70

**Cut-off Values for Anthropometric Variables That Confer Increased Risk of Type 2 Diabetes Mellitus and Hypertension in Iraq**Mansour AA<sup>1</sup>, Al-Jazairi MI<sup>2</sup><sup>1</sup>Department of Medicine, Basrah College of Medicine, Basrah, Iraq<sup>2</sup>Department of Medicine, Al-Faiha Hospital, Basrah, Iraq

**Background:** Body mass index (BMI) is often used to reflect total body fat amount (general obesity), whereas waist circumference (WC), waist-to-hip ratio (WHpR) or waist-to-height ratio (WHtR) is used as a surrogate of body fat centralization (central obesity). The purpose of the present study was to identify cut-offs for BMI and upper-body adiposity (WC, WHpR, and WHtR) that, associated with increased risk of type 2 DM and hypertension in Iraqi adults, would be consistent with overweight and central adiposity.

**Methods:** This was a community-based cross-sectional survey for establishing cut-off values for BMI and upper-body adiposity (WC, WHpR or WHtR) associated with increased risk of type 2 DM and hypertension from one district in Southern Iraq, Basrah (Abu-Al-khasib). The total number of persons involved was 12,986 (6693 men and 6293 women), aged 45.6 ± 15.7 years.

**Results:** The cut-off point in men associated with increased risk of type 2 DM and hypertension were BMI 25.4 and 24.9, WC 90 and 95 cm, WHpR 0.92 for both and WHtR 0.52 and 0.55, respectively. For women, the cut-off point associated with increased risk of type 2 DM and hypertension were BMI 26.1 and 26.5, WC 91 and 95 cm, WHpR 0.91 for both, and for WHtR 0.56 and 0.59, respectively. The best index for association with type 2 DM was WHpR with cut-off point of 0.92 for men and 0.91 for women. For hypertension, the best index is WHtR (with cut-off point of 0.55 for men and 0.59 for women); where as the least reliable index was the BMI for both type 2 DM and hypertension.

**Conclusions:** Our finding showed that, in Iraqi adults, WHpR has the strongest association with type 2 DM and WHtR for hypertension.

## T1:PS.72

**Blunted metabolic response to fasting in obese mice.**Ueno N,<sup>2</sup>Asakawa A,<sup>2</sup>Inui A<sup>1</sup>Department of Internal Medicine, Kobe Seaside Hospital, Japan;<sup>2</sup>Division of Behavioral Medicine, Department of Social and Behavioral Medicine, Kagoshima University Graduate School of Medical and Dental Sciences, Japan

The aim of the study was to evaluate metabolic changes in response to fasting in normal and obese mice. C57BL6 and obese (diet-induced obesity (DIO) and ob/ob) mice were used in this study. They were fasted for 24 hours and re-fed for 24 hours. Body weight was monitored before, after fasting and during re-feeding (2 and 24 hours after re-feeding). Food intake was measured 2 and 24 hours after re-feeding began. Blood samples were taken before and after 24 hours fasting. As metabolic parameters, blood glucose, plasma insulin, ghrelin levels and oxygen consumption were measured. Blood glucose and plasma insulin levels in DIO and ob/ob mice were higher than normal mice, and plasma ghrelin levels were lower in DIO and ob/ob mice. There was reduced body weight loss in DIO mice than in normal mice for 24 hours fasting. When they were re-fed, DIO and ob/ob mice consumed less food intake than normal mice. 24 hours food deprivation induced significantly smaller plasma ghrelin elevation in these obese mice. Fasting-induced decrease in oxygen consumption was significantly smaller in DIO and ob/ob mice than normal mice. This data shows that obese mice may have decreased sensitivity to fasting-induced increase in circulating ghrelin and their oxygen consumption exhibited a blunted response to fasting.

## T1:PS.71

**Sequential changes in the expression of genes involved in lipid metabolism in adipose tissue and liver in response to fasting**

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The aim of this study was to provide a sequential analysis of the expression patterns of key genes involved in lipid metabolism in white adipose tissue (WAT) and liver and their relationship with blood parameters in response to fasting. Adult male Wistar rats were studied under different feeding conditions: feeding state, after 4, 8 or 24 h fasting, and after 3 h refeeding following 8 h fasting. Blood parameters and the expression (by RT-qPCR) of genes involved in lipogenesis and lipolysis in WAT and in liver were analysed. mRNA levels of genes involved in lipogenesis in liver (SREBP1c, FAS and GPAT) had already decreased after 4 h fasting, as well as those of PPARgamma in WAT, while the decrease in SREBP1c, FAS, GPAT and GLUT4 mRNA levels in WAT was observed after 8 h. Concerning lipolytic genes, liver PPARalpha and CPT1 mRNA levels increased after 8 h fasting and those of ACOX1 after 24 h, and in WAT, only ATGL and CPT1 mRNA levels were greater after 24 h. 3 h refeeding increased the expression levels of PPARgamma in WAT, SREBP1c in both liver and WAT, and GPAT in liver, and decreased the expression levels of PPARalpha and CPT1 in liver.

These results give new insight into the different adaptive time course response to food deprivation in the expression of genes involved in the lipid metabolism, thus pointing out the very rapid response of lipogenic genes, particularly in liver, and the later response of lipolytic genes, particularly in WAT.

## T1:PS.73

**Caloric restriction modulates adipose tissue cellularity and lipid storage function**Ding Q<sup>1</sup>, Kirkby G<sup>1</sup>, Ash C<sup>2</sup>, Mracek T<sup>1</sup>, Merry B<sup>2</sup>, Bing C<sup>1</sup><sup>1</sup>Obesity Biology Unit, School of Clinical Sciences, University of Liverpool, Liverpool, UK<sup>2</sup>School of Biological Sciences, University of Liverpool, Liverpool, UK

Ageing is associated with accumulation of body fat and the development of insulin resistance. White adipose tissue (WAT) emerges as an important organ in controlling lifespan. Caloric restriction (CR) delays the rate of ageing, which may be modulated partly by altering the amount and function of WAT. This study examined whether CR alters WAT cellularity, and whether CR affects expression of genes involved in lipid metabolism, including adipose triglyceride lipase (ATGL), adiponectin and its receptors (AdipoR1 and AdipoR2) in WAT and adipocytes.

Epididymal WAT was dissected from male Brown Norway rats that had undergone CR (55% of *ad libitum* intake) for 4 months or been fed *ad libitum*. Adipocytes were isolated from WAT following collagenase digestion. The morphometric analysis of adipocytes was performed. Gene expression was quantitated by real-time PCR. Circulating FFA, glycerol and adiponectin levels were determined using commercial kits. CR markedly reduced epididymal fat mass (-42%), adipocyte diameter (-17%) and sectional area (-33%). CR led to an increase in ATGL mRNA levels in both WAT and adipocytes (>2-fold), which was paralleled by a 2-fold rise in plasma FFA and glycerol, respectively. Adiponectin mRNA levels were elevated in both WAT and adipocytes (>2-fold) as were circulating adiponectin (2.5-fold) in CR rats. However, CR had no effects on AdipoR1 and AdipoR2 expression at tissue or cell level.

It is concluded that CR reduces fat mass and lipid storage in WAT. These changes might result from increased lipolysis in WAT and enhanced adiponectin production to stimulate lipid utilization in other tissues.

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## T1:PS.74

**Characterization of dipeptides as potential dipeptidyl peptidase IV inhibitors and determination of their transport properties**

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**Background:** Dipeptidyl peptidase IV (DPP-IV) preferably cleaves Xaa-Pro dipeptides from polypeptides. Although a variety of regulatory peptides are theoretical substrates of DPP-IV, only a few peptides as glucagon-like peptide 1 (GLP-1) and glucose-dependent insulinotropic peptide (GIP) have been demonstrated to be physiological substrates of DPP-IV *in vivo*. Inhibitors of DPP-IV are being developed to prolong the biological activity of insulinotropic peptides as a novel approach in the treatment of diabetes. Furthermore, DPP-IV inhibition has been suggested to be beneficial for satiety enhancement by slowing down gastric emptying via elevated GLP-1 levels.

**Aim:** This study was initiated to test whether dipeptides can serve as DPP-IV inhibitors and to examine systematically the effect of amino acid substitutions in dipeptides on their DPP-IV inhibitory activity.

**Methods:** A series of dipeptides with focus on Xaa-Pro, Xaa-Ala, Pro-Xaa, Ala-Xaa, Xaa-Trp, Trp-Xaa was synthesized and DPP-IV inhibition was measured using a 96-well enzyme-based assay with the artificial substrate Gly-Pro-p-nitroanilide. Transepithelial transport of dipeptides was measured across Caco-2 monolayers using a Transwell<sup>®</sup> system and HPLC-MRM-MS quantification.

**Results:** Only a few dipeptides exhibited inhibitory activity at inhibitor concentrations <1 mM. DPP-IV inhibitory dipeptides displayed  $K_i$  values between 0.03 mM and 1 mM. Structural analyses showed that a Trp-residue in N-terminal position improves inhibitory activity, whereas a C-terminal Trp residue had no effect on DPP-IV activity. With a  $K_i$  value of 0.03 mM, Trp-Arg displayed the highest dipeptide affinity to DPP-IV. Transport rates of dipeptides across Caco-2 cells were however low, with the highest apparent permeability ( $P_{app}$ ) found for Gly-Pro ( $P_{app} = 145 \pm 5 \cdot 10^{-8} \text{ cm}^2 \cdot \text{s}^{-1}$ ). Most Trp-Xaa did not show significant transport rates.

**Conclusion:** We conclude that some specific dipeptides can serve as low affinity DPP-IV inhibitors. The inhibitory effect is defined by the N-terminal amino acid residue whereas the C-terminal residue only modulates further inhibitory activity. Transport of DPP-IV inhibitory dipeptides across intestinal cell monolayers is however very limited and thus it is questionable whether natural peptides can serve as DPP-IV inhibitors *in vivo*.

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## T1:PS.76

**Effects of trans-10,cis-12 conjugated linoleic acid on body fat accumulation and lipogenic enzyme expression in adipose tissue: a comparative study between young and adult hamsters**

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The effectiveness of the *trans-10,cis-12* conjugated linoleic acid (CLA) isomer as a body fat-lowering agent can be affected by several factors such as animal species, sex and age, diet composition and treatment period length. The purpose of the present work was to compare the effects of this CLA isomer on body fat accumulation, as well as on lipogenic enzyme expression, between young and adult hamsters, in order to determine the influence of age.

Young (9-week-old) and adult (8-month-old) male Syrian Golden hamsters were divided into four groups (n=8) and fed high-fat diets containing 0.5% linoleic acid (control groups) or 0.5% *trans-10,cis-12* CLA for 6 weeks. Perirenal (PR), epididymal (EP) and subcutaneous (SC) adipose tissues were dissected and weighed, and acetyl CoA carboxylase (ACC) and fatty acid synthase (FAS) expressions were measured by RT-PCR in SC depot.

Young hamsters fed the CLA-enriched diet showed a significant decrease in adipose tissue weight from all the anatomical locations analyzed (PR: -29%; EP: -21%; SC: -29%). In contrast, in adult animals only SC adipose tissue was significantly reduced (-28%). No CLA effect on lipogenic enzyme expression was observed. Although a tendency towards reduced expression of lipogenic enzymes was found in adult hamsters when compared with young hamsters, the difference did not reach statistical significance.

These results show that CLA induced body fat reduction is greater in young than in adult hamsters, suggesting that aging reduces *trans-10,cis-12* CLA effectiveness. This difference was not due to a differential effect on lipogenic enzymes.

## T1:PS.75

**Effects of oxidized-LDL on glucose uptake in human omental adipocytes**Masella R<sup>1</sup>, Scaccocchio B<sup>1</sup>, Vari R<sup>1</sup>, Santangelo C<sup>1</sup>, D'Archivio M<sup>1</sup>, Iacovelli A<sup>2</sup>, Silecchia G<sup>3</sup>, Giovannini C<sup>1</sup><sup>1</sup> Istituto Superiore di Sanità, Rome, Italy<sup>2</sup> Fabia Mater Clinic, Rome, Italy<sup>3</sup> University of Rome "La Sapienza", Rome, Italy

Oxidative stress induces insulin-resistance by reducing the response of adipocytes to insulin, consequently affecting their functionality. Obesity is associated with insulin-resistance and increased plasma oxidized-LDL. The aim of this study was to evaluate the effects of oxidized-LDL on the sensitivity of human omental adipocytes to insulin stimulation, by evaluating the glucose uptake. Human adipocytes were isolated from omental biopsies obtained from individuals undergoing abdominal surgery for benign conditions. Briefly, adipose biopsies were digested with Krebs-Ringer solution containing collagenase (1mg/g adipose tissue) for 1h at 37°C. The isolated cells were characterized by Oil Red O staining and mRNA expression of leptin and adiponectin. Moreover the expression of Pref-1 was determined to detect possible pre-adipocyte contamination. After 24h, the cells were serum starved for 3h with or without 0.1 mg/ml native- or oxidized-LDL, and incubated with 0.1μM insulin for 30 min. Glucose uptake was measured by 2-deoxy-D-[<sup>3</sup>H] glucose. The isolated adipocytes showed a mature phenotype and a high sensitivity to insulin stimulation as demonstrated by the 100% increase of glucose uptake with respect to un-stimulated cells. In cells treated with native-LDL the uptake was comparable to that of control cells. On the contrary, the treatment with oxidized-LDL resulted in a marked decrease (-40%) of insulin-induced glucose uptake. This result did not depend on cytotoxicity as demonstrated by the [<sup>3</sup>H]uridine incorporation which was comparable in treated and control cells.

Oxidized-LDL may contribute to insulin-resistance in human omental adipocytes by decreasing the uptake of glucose. These results suggest a close relationship among obesity, increased oxidized-LDL and insulin-resistance.

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## T1:PS.77

**3,5-Diiodo-L-thyronine improves glucose tolerance in high fat fed rats**Mollica, M.P.<sup>1</sup>, Lionetti L.<sup>1</sup>, Cavaliere G.<sup>1</sup>, Moreno M.<sup>2</sup>, Lanni A.<sup>3</sup>, De Lange P.<sup>3</sup>, Lombardi A.<sup>1</sup>, Silvestri E.<sup>2</sup>, Goglia F.<sup>2</sup>, and Barletta A.<sup>1</sup><sup>1</sup> Dipartimento delle Scienze Biologiche, Sezione Fisiologia ed Igiene, Università degli Studi di Napoli "Federico II"<sup>2</sup> Dipartimento di Scienze Biologiche ed Ambientali, Università degli Studi del Sannio<sup>3</sup> Dipartimento di Scienze della Vita, SUN

**Aim:** High fat diet (HFD) is associated with the development of steatosis and insulin resistance. Recent evidences suggest that 3,5-diiodo-L-thyronine (T2), a naturally occurring iodothyronine, when administered to HFD fed rats, prevents steatosis. However, studies on T2 effects on insulin resistance and oxidative stress, which is known to be involved in insulin resistance and liver steatosis, are still lacking. In the present research, we detected the ability of T2 to improve HFD-induced impaired glucose tolerance, liver steatosis and oxidative stress.

**Methods:** Three groups of rats were used: control rats receiving standard diet (N), rats receiving HFD (D), rats receiving HFD and a daily i.p. injection of T2 (25μg/100 g b.w.) (DT2). The experimental period lasted 4 weeks. Oral glucose tolerance test was performed after 16 hours fasting. In liver mitochondria, aconitase activity, as an index of mitochondrial oxidative stress, and fatty acid oxidation rate were detected.

**Results:** D rats showed decreased glucose tolerance and elevated plasma insulin, while DT2 rats were characterized by improved glucose tolerance. The livers of D rats were lighter in colour than DT2 livers, suggesting that they contained more fat. At the hepatic level, mitochondrial fatty acid oxidation rate progressively increased in N, D and DT2 rats. When compared to N, D rats showed an increase in oxidative stress which was prevented by T2 treatment.

**Conclusions:** T2 improved HFD-induced impaired glucose tolerance as well as prevented liver steatosis by activating mitochondrial fatty acid oxidation rate and decreasing oxidative stress.

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## T1:PS.78

**Adipose triglyceride lipase expression in brown adipose Tissue, contrary to what happens in white adipose tissue, is not regulated by feeding conditions**

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Adipose triglyceride lipase –ATGL– (also known as desnutrin) is a cytoplasmic protein which is mainly expressed in adipose tissue and has lipase activity, hydrolyzing triacylglycerols to diacylglycerols, acting together with the hormone-sensitive lipase in the process of lipolysis. ATGL mRNA levels are regulated by the nutritional status, being induced after fasting. We have studied possible differences in ATGL expression in different white adipose tissue depots and in brown adipose tissue of Wistar rats of different ages (1, 3, 5, 7 and 13 months), distributed in a control and a 14 h-fasted group.

The different adipose tissue depots studied express different amounts of ATGL, with the highest levels found for all the ages in the brown adipose tissue in comparison with the white fat. Fasting up-regulates ATGL expression only in white adipose tissue and, moreover, this up-regulation is lost with age, contributing to an increased difficulty for mobilizing lipids in older animals in response to a nutritional stress as is fasting. However, and despite the high levels found in brown fat, ATGL expression is not affected by fasting at any of the ages studied in this tissue. This fact has not been previously reported and would indicate a different regulation for ATGL in brown fat, independent of feeding conditions.

## T1:PS.80

**Insulin resistance and body composition in pre and post-menopause women with or without overweight**Mascarenhas M R<sup>1,2</sup>, Camolas J<sup>3</sup>, Vieira J<sup>3</sup>, Rodrigues I<sup>3</sup>, Carvalho M R<sup>3</sup>, Colaço D<sup>3</sup>, Baião A<sup>3</sup>, Duarte D<sup>2</sup>, Conceição C<sup>2</sup>, Pinto D S<sup>2</sup>, Bicho M<sup>1</sup>, do Carmo I<sup>3</sup>

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**Introduction:** Insulin resistance is frequently associated with alterations of body composition, mainly with the higher proportion of fat total body mass and the abdominal fat tissue, most common in the post-menopause condition.

**Aims:** To study the associations between insulin resistance and body mass composition in pre and post-menopause women with normal and excessive weight.

**Material and Methods:** In 762 women, the body mass composition was determined by DXA and fasting glucose and insulin were measured. The HOMA index was calculated as a measure to access insulin resistance. Insulin resistance was assumed for HOMA values  $\geq 4$ . This sample was divided in the pre-menopause (n=389) and the post-menopause (n=373) groups, which were also subdivided in normoponderal (n=142), pre-obese (n=302), and obese (n=318) subgroups. Data were submitted to descriptive analysis, correlation and comparison tests.

**Results:** The mean lean body mass was higher in pre-menopause women (p<0.05). The mean HOMA were higher in the pre-obesity women with post-menopausal (p<0.05). In women with insulin resistance, higher BMI and fat mass percentage were detected (p<0.05). Correlations between HOMA and body composition were observed in both groups (p<0.05).

**Conclusions:** These data seems to support the existence of relations between body composition and insulin resistance in the post-menopause women. The results may justify the need of a more effective approach in the treatment and most importantly in the prevention of weight gain and in the body fat mass increase, aiming for the reduction of insulin resistance.

## T1:PS.79

**In overweight rats oleoyl-estrone and rosiglitazone exert opposite changes in white adipose tissue lipid handling and regulation**Ferrer-Lorente, R<sup>1</sup>, Cabot, C<sup>1,2</sup>, Fernández-López, JA<sup>1,2</sup>, Alemany, M<sup>1,2</sup>, Remesar, R<sup>1,2</sup>

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Thiazolidinedione treatment often results in redistribution and/or increase in body fat whilst improving insulin resistance. Oleoyl-estrone (OE) treatment also enhances insulin sensitivity, but its main effect is to deplete body lipid stores. We compared the effects of rosiglitazone (RG) or OE, alone or in combination, on different white adipose tissue (WAT) sites in order to gain insight into the mechanism of action of OE and to study ways to limit thiazolidinedione-induced increases in body fat.

Four groups of overweight male Wistar rats were used for a 10-day treatment: Controls (C), OE-treated (OET), RG-treated (RGT), and combined OE plus RG treatment (RG+OET); After sacrifice, ventro-lateral strips of subcutaneous (S), epididymal (E), retroperitoneal strip (R), and mesenteric (M) WAT pads were dissected and used for semiquantitative real time PCR measurement of specific mRNAs concentrations in WAT.

In the four sites tested, OE markedly decreased the expression of GLUT4, adiponutrin, fatty acid synthase and acetyl-CoA carboxylase; It also decreased the expression of lipoprotein lipase, SREBP1c, C/EBPalpha, C/EBPbeta and PPARgamma1 when considering all WAT. RG elicited an increase in the expression of fatty acid synthase, acetyl-CoA carboxylase and adiponutrin in the four sites and induced global increases in the expression of GLUT4, lipoprotein lipase, PPARgamma1 and PPARgamma2.

OE and RG show a widely different pattern of change in WAT energy metabolism and regulatory indicators' gene expression. The results hint that OE induced a marked depression in WAT metabolic activity and decrease adipogenesis while the RG effects on rats were practically the reverse.

## T1:PS.81

**Prevalence of metabolic syndrome in overweight and obese adolescents**Kollias, A<sup>1</sup>, Syrigos, D<sup>2</sup>, Chatziantonakis, N<sup>2</sup>, Papatimoneou, V<sup>2</sup>, Antonodimitrakis, P<sup>3</sup>, Kiriakou, A<sup>3</sup>, Syrigou, N<sup>2</sup>, Grammatikos, E<sup>2</sup>, Skliros, E.A.<sup>1</sup>

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**Background and aim:** Childhood obesity raises worldwide concern due to its progressively increasing prevalence and associated cardiovascular risk factors. Studies suggest the growing presence of a clustering of metabolic abnormalities, known as the metabolic syndrome (MS), in children, with its prevalence increasing with the severity of the obesity. The aim of our study was to identify MS phenotype in overweight/obese young individuals in a rural Greek region.

**Methods:** The study included 102 students [13.73±0.84 years old, Body Mass Index (BMI): 28.19±0.34 Kg/m<sup>2</sup>] from randomly selected schools with BMI corresponding to overweight or obese state according to International Obesity Task Force references. The students were subjected to blood pressure (BP) assessment and blood withdrawal in order to determine biochemical parameters. For the definition of the MS, the criteria of the NCEP Adult Treatment Panel adjusted to children were used.

**Results:** 44.2% of the obese subjects and 15.8% of the overweight were detected as having MS (p=0.002). Hypertriglyceridemia (71.9%) and hypertension (68.8%) were the most common parameters of MS in these subjects. BMI was significantly (p<0.05) related to BP (both systolic and diastolic), total cholesterol (TC), low-density lipoprotein (LDL-C), triglycerides (TG) and negatively to high-density lipoprotein (HDL-C) independently of age and sex. Obese adolescents had higher BP and more abnormal lipid profile compared to overweight but similar glucose values.

**Conclusion:** A clear and constant association between increased BMI and metabolic abnormalities - especially with a constellation of these - was revealed, fact which renders lifestyle interventions imperative from early years.

## T1:PS.82

**Effect of oleoyl-estrone on the regulation of cholesterol metabolism through gene expression in the overweight rat**

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Oleoyl-estrone (OE) decreases food intake without changes in energy expenditure; the energy gap is fulfilled by stored lipid mobilization. OE decreases circulating cholesterol, the effects being more marked in hyperlipidemic obese rats.

Three groups of overweight male Wistar rats were used: controls (C), OE-treated (OEt) and pair fed (PF). All received a daily oral gavage of 0.2 mL of sunflower oil, supplemented in OEt with 10 nmol/g OE. The PF were given only the food consumed by OEt.

Plasma cholesterol, liver DNA and mRNA were measured; tissue RNA was used for the analysis of the expression of key enzymes of liver cholesterol metabolism.

Plasma cholesterol was halved in OEt and unchanged in PF. Pair-feeding reduced the expression of 3-HMGC<sub>o</sub>A synthase and the LDL receptor; but cholesterol synthesis was not affected by OE, nor was the expression of LCAT in all groups. Cholesterol disposal for bile acid synthesis was increased in PF and OE rats, as shown by the expression of cholesterol 7-hydroxylase, suggesting the activation of cholesterol disposal. Reverse cholesterol transport was enhanced in OEt because of increased expression of apoA, apoE and ABC transporter A1.

In conclusion, the active disposal of cholesterol by the liver helps explain its marked effects on cholesterol handling, which can not be attributed to decreased energy intake.

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## T1:PS.84

**Increased hepatic IRS-2 expression and absence of hepatic steatosis in TNF- $\alpha$  KO mice fed high-fat (HF) diet for 4 wk.**

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Prolonged HF feeding gradually leads to whole-body insulin resistance. TNF- $\alpha$  deficiency has been shown to protect against this effect in several models, although the mechanism is unclear. We therefore investigated whether genetic TNF- $\alpha$  deficiency affects fat deposition and intracellular insulin signaling in liver and adipose tissue in TNF- $\alpha$  KO and wild type (WT) mice fed chow (CH) or HF (60% energy) diet. After 4 wk HF diet access we measured plasma glucose, insulin, leptin and resistin levels after 12-h fasts or 3-h re-feeding, body adiposity and liver fat content, and hepatic PI3K, SOCS3, IRS-2 and PPAR $\gamma$  expression. TNF- $\alpha$  deficiency had no effect on body adiposity, which increased more in HF than CH mice. KO HF mice had improved insulin sensitivity and lower fed and fasted leptin levels than WT HF mice. Resistin levels were lower in KO vs. WT mice regardless of diet. Liver fat content was increased 3 fold in WT vs. KO HF mice, and the latter was similar to CH mice. Liver fat pad IRS-2 expression was 60 % higher in KO vs. WT HF mice. No other downstream genes were affected in the liver. These results suggest that genetic TNF- $\alpha$  deficiency protects against the development of insulin resistance elicited by 4 wk of HF feeding by (a) up-regulation of IRS-2 in the liver, which prevents downstream insulin signaling failure and hepatic steatosis; (b) preventing the expected increase in leptin levels, probably via a non-insulin dependent mechanism; and (c) diet-independent maintenance of low resistin levels.

## T1:PS.83

**Adiponectin controls macrophage sensitivity and tolerance to pro-inflammatory stimuli via induction of IRAK-M\***

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Adiponectin, an adipokine produced exclusively by adipocytes, exerts anti-inflammatory effects on macrophages. It suppresses the production of pro-inflammatory cytokines in response to bacterial lipo-poly-saccharide (LPS). We have shown that the anti-inflammatory effect of adiponectin is more complicated than previously thought and involves induction of macrophage tolerance. More specifically, in the THP-1 human macrophage cell line, in primary mouse peritoneal macrophages and in primary human peripheral macrophages that have not been pre-exposed to adiponectin, exposure to globular adiponectin (gAd) induces TNF-alpha and IL-6 secretion. However, pre-exposure of macrophages to 10 microg/ml gAd renders them tolerant to further gAd exposure or to other pro-inflammatory stimuli such as TLR3 ligand polyI:C and TLR4 ligand LPS, while pre-exposure to low levels of gAd was ineffective in inducing tolerance. We further investigated the mechanism involved in adiponectin-mediated macrophage tolerance. We have found that adiponectin inhibits the TLR signalling pathway. More specifically, gAd induces IRAK-M expression in macrophages both at the protein and the mRNA level. Homologous deletion of IRAK-M partly abolished the tolerogenic effect of gAd since pre-treatment of IRAK-M  $-/-$  macrophages with gAd did not suppress LPS-induced pro-inflammatory cytokine production. In conclusion, our data suggest that the constant presence of high levels of adiponectin in the blood of lean subjects renders their macrophages resistant to pro-inflammatory stimuli, including that of adiponectin itself via regulation of IRAK-M expression.

## T1:PS.85

**The 2-keto(<sup>13</sup>C)isocaproate breath test in obese subjects is associated with the sirtuins gene expression in peripheral blood mononuclear cells (pbmc).**

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**Aim:** It has been suggested a direct link between sirtuins and mitochondrial bioenergetics. The aim of this study was to evaluate the relationship between a non-invasive approach to estimate the mitochondrial oxidation in vivo, the 2-keto(<sup>13</sup>C)isocaproate (<sup>13</sup>C-KICA) breath test with SIRT1 and SIRT2 gene expression in PBMC.

**Methods:** PBMC were isolated of twelve obese subjects (50% men/women; 38±7y.o; 32.3±5.5kg/m<sup>2</sup>) to obtain the RNA. The gene expression of SIRT1 and SIRT2, as well as COX15 and NDUFS2 were performed by RT-PCR. Breath samples were recovered at baseline and at 10 min intervals for 2 h after ingestion of the test drink contained <sup>13</sup>C-KICA.

**Results:** The SIRT2 gene expression was directly associated with the kinetic constant, *tau*, which represents the temporal evolution of the <sup>13</sup>C-KICA mitochondrial oxidative rate ( $r=0.60$ ;  $p=0.039$ ) and marginally tended to be correlated with the area under the kinetic curve after 2h,  $AUC_{0-120}$  ( $r=0.56$ ;  $p=0.059$ ) and after the last 60',  $AUC_{60-120}$  ( $r=0.50$ ;  $p=0.095$ ) of <sup>13</sup>C-KICA oxidative rate. The SIRT1 gene expression was associated with *tau* ( $r=0.77$ ;  $p=0.005$ ) and  $AUC_{0-120}$  ( $r=0.62$ ;  $p=0.044$ ). Moreover, *tau* also tended to be correlated with the NDUFS2 ( $r=0.54$ ;  $p=0.071$ ) and was associated with COX15 ( $r=0.62$ ;  $p=0.032$ ) gene expression, two proteins related to complex II and complex IV of the mitochondrial respiratory chain, respectively.

**Conclusion:** Overall, these results provide a new insight for the application of the non-invasive <sup>13</sup>C-KICA breath test on the evaluation of the obesity therapy outcome given its relationship with the mitochondrial efficiency markers, such as the sirtuins and respiratory chain related proteins.

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## T1:PS.86

**Improvement of insulin sensitivity following weight loss does not affect the reduction of total and high molecular weight adiponectin levels induced by hyperinsulinemia.**

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Weight loss with or without exercise is associated with improvement in insulin sensitivity (IS) and increased levels of total and high molecular weight (HMW) adiponectin in obese individuals. Acute hyperinsulinemia, on the other hand, correlates with reduction of total and HMW adiponectin. To clarify the inhibitory role of insulin on adiponectin, total and HMW adiponectin levels were measured during acute hyperinsulinemia before and after weight loss. Fifty-five postmenopausal women were randomized to either a 6 month caloric restriction alone (CR, n = 28) or CR with resistance training (CR-RT, n = 27). Body composition (DEXA) and IS (hyperinsulinemic euglycemic clamp) were assessed before and after weight loss. Total and HMW adiponectin levels were measured by ELISA at baseline, 60, 160 and 180 minutes of each clamp. Relative mean body weight loss was 7.8% for both groups (CR: -7.7 ± 0.7%, CR-RT: -7.9 ± 1.0%). IS increased significantly by 11.3% (CR: 9.4 ± 6.3%, CR-RT: 13.2 ± 4.7%). Before each intervention, total and HMW adiponectin levels in both groups significantly decrease in response to hyperinsulinemia (total: 7.8 ± 2.5% vs HMW: 2.6 ± 1.6%). Despite the improvement in IS seen after each intervention, a similar pattern of reduction in total and HMW adiponectin levels was observed during hyperinsulinemia. Taken together, these results attest that total and HMW adiponectin levels are reduced during hyperinsulinemia. Also, the insulin-sensitizing effect of weight loss via caloric restriction alone or with resistance training does not alter adiponectin level reduction observed during hyperinsulinemia.

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## T1:PS.88

**Expression of adipocytokines in adipose tissue of obese type 2 diabetic subjects before and after major weight reduction.**

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Adiponectin (APM1) and visfatin have been linked with obesity in opposite manner. We examined the effect of weight-loss on the APM1, its receptors (AdipoR1 and AdipoR2) and visfatin expression in abdominal subcutaneous adipose tissue (SAT) of morbidly obese subjects with or without diabetes. In 10 obese non-diabetic subjects (NGT) and 10 obese diabetic patients (DM2), SAT tissue was obtained during bariatric surgery and again one year after surgery. mRNA relative quantifications of APM1, AdipoR1, AdipoR2 and visfatin were performed by RT-PCR. After surgery, BMI was reduced in NGT and DM2 subjects (-15.9 ± 3.6 and -15.9 ± 6.1 kg/m<sup>2</sup>, respectively, p < 0.0001). Fasting plasma insulin was reduced in both groups (-15.3 ± 11.3 and -13.1 ± 9.4 μU/ml, p < 0.01). Fasting plasma glucose was reduced in DM2 only (-2.9 ± 1.6 mmol/l, p = 0.001). Following weight loss, plasma adiponectin increased in both groups (+4.72 ± 3.29 and +6.56 ± 4.92, p = 0.0003, respectively), APM1 did not change in NGT, (3.83 ± 1.25 vs 4.08 ± 2.01, p = ns), whereas it increased in DM2 (2.69 ± 1.32 vs 4.77 ± 1.26, p = 0.0035). AdipoR1 was not changed by weight loss in either group (3.49 ± 1.18 vs 2.83 ± 0.98 and 2.73 ± 1.29 vs 2.89 ± 2.89 respectively, p = ns); this was also true of AdipoR2 (4.92 ± 2.84 vs 3.88 ± 1.7 and 4.18 ± 3.02 vs 3.76 ± 1.3 respectively, p = ns). Conversely, visfatin expression decreased both in NGT (2.12 ± 1.15 vs 1.02 ± 0.27, p = 0.008) and DM2 (3.09 ± 2.56 vs 1.02 ± 0.24, p = 0.028) after weight loss.

We conclude that, whereas adiponectin receptor expression is not altered following weight loss, visfatin expression in subcutaneous fat falls markedly with weight reduction. In addition, adiponectin expression increases in weight-reduced diabetic subjects, possibly contributing to their improved insulin sensitivity.

## T1:PS.87

**Adipose tissue transcriptomic signature highlights the pathological relevance of extracellular matrix associated with inflammation in human obesity**

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Investigations performed in mice and humans have acknowledged obesity as a low-grade inflammatory disease. Several molecular mechanisms have been convincingly involved in activating inflammatory processes and altering cell composition in white adipose tissue (WAT). However, the overall importance of these alterations, and their long-term impact on the metabolic functions of the WAT and on its morphology, remain unclear. We analyzed the transcriptomic signature of the subcutaneous WAT in obese human subjects, in stable weight conditions and after weight loss following bariatric surgery. An original integrative functional genomics approach was applied to quantify relations between relevant structural and functional themes annotating differentially expressed genes, to construct a comprehensive map of transcriptional interactions defining the obese WAT. These analyses highlighted a significant up-regulation of genes and biological themes related to extracellular matrix (ECM) constituents, including members of integrins family, and suggested that these elements could play a major mediating role in a chain of interactions which connects local inflammatory phenomena to the alteration of WAT metabolic functions in obese subjects. Tissue and cellular investigations, driven by the analysis of transcriptional interactions, revealed an increased amount of interstitial fibrosis in obese WAT, associated with an infiltration of different types of inflammatory cells, and suggested that phenotypic alterations of human preadipocytes, induced by a proinflammatory environment, may lead to an excessive synthesis of ECM components. Our study opens new perspectives in understanding the biology of human WAT and its pathologic changes indicative of tissue deterioration, associated with the development of obesity.

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## T1:PS.89

**Altered Cardiac Autonomic Function in Subjects with Overweight and Obesity**

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Little is known about the altered cardiac autonomic function (CAF) across different levels of body mass index (BMI). This study wanted to clarify the CAF change in subjects with underweight, normal weight, overweight, and obesity. According to the WHO Asia-Pacific BMI cutoffs, a total of 1437 subjects were classified as underweight (n=74), normal weight (n=588), overweight (n=313), and obesity (n=462). CAF was determined by standard deviation of normal-to-normal (SDNN) intervals or RR intervals, power spectrum in low and high frequency, and LF/HF ratio at supine for five minutes, the ratio between 30th and 15th RR interval after standing from the supine position (30/15 ratio), and the average heart rate change while taking six deep breaths in one minute (HRDB).

There were significant differences in age, gender, socioeconomic status, blood pressure, HOMA IR index, fasting glucose, lipid profiles, and the prevalence of hypertension, ischemic/LBBB EKG pattern, current smoking, and alcohol use among subjects with underweight, normal weight, overweight, and obesity. Univariate analysis showed that SDNN, HRDB, HF power, and the square root of the LF/HF ratio differed among these four groups. Multivariate analysis showed that obesity was inverse correlates of HRDB and HF power. Overweight and obesity were positively associated with the square root of the LF/HF ratio. However, no BMI status was related to SDNN, 30/15 ratio, or LF power.

In conclusions, the risk for altered CAF is significant in overweight and obese subjects, independent of cardiovascular risk factors.

## T1:PS.90

**Regional variation in visceral adipose tissue secretory function among morbidly obese premenopausal women.**

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Visceral fat accumulation is a greater health hazard than subcutaneous abdominal (SC ABD) adipose tissue (AT) deposition, as delivery of fatty acids (FA) from omental (OME), and mesenteric (MES) adipocytes to the liver may contribute to metabolic abnormalities. The purpose of this study was to examine regional variation in factors involved in FA metabolism and coronary heart disease risk of morbidly obese women undergoing bariatric surgery.

**Methods:** Metabolic, pro-atherogenic and prothrombotic characteristics of SC ABD-AT and intraabdominal fat depots, the OME, MES and round ligament (RL), were compared in two groups of women paired for age (39±9 yr) and body mass index (52±11 kg/m<sup>2</sup>), and having (n=25) or not (n=24) dysmetabolic profile. AT gene expression was assessed by real-time quantitative PCR, using GAPDH as internal control.

**Results:** Dysmetabolic (DYS) women showed higher triglyceridemia and glycemia and lower HDL-cholesterol concentrations, compared to non-dysmetabolic (N-DYS) subjects (p<0.0001). Fasting insulinemia, adiponectinemia and TNF-α levels were higher in DYS than in N-DYS women (0.05<p<0.0005). Neither lipoprotein lipase nor hormone-sensitive lipase expression differed among groups and sites. Expression of angiotensinogen (AGT) and 11-β hydroxysteroid dehydrogenase-1 (11-βHSD1) in RL, and of AGT and TNF-α in MES was higher in DYS than in N-DYS women (0.05<p<0.0005). Although SC ABD-AT adiponectin expression was lower in DYS compared to N-DYS women, 11-βHSD1, IL-6 and PAI-1 mRNA levels were higher in OME of former subjects (0.05<p<0.0005).

**Conclusion:** Although intraabdominal fat depots displayed pro-atherogenic and prothrombotic characteristics, OME seemed to be more deleterious than MES and RL regions, in DYS women.

## T1:PS.92

**Study of the SNP45T>G polymorphism in the adiponectin gene in Tunisian obese population**

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Adiponectin is known to be protective against the development of insulin resistance and atherosclerosis. The aim of the study was to evaluate the relationship between the SNP45T>G polymorphism of adiponectin gene (exon2) and adiponectin and insulin levels and lipid parameters in obese versus non obese subjects. Subjects and methods: the study concerned 112 obese subjects and 74 non obese controls. All subjects underwent a clinical examination, biological investigations (basal and two hours blood glucose and insulinemia, adiponectin, total cholesterol, HDLc and triglycerides) and a genetic study of the adiponectin gene. Results: adiponectin levels were significantly lower in obese vs non obese (4.4 ±0.95 vs 8.7±1.54µg/ml, p<0.001). We noted a higher frequency of the genotype GG in obese vs non obese subjects (8.1 vs 4.0%, NS), a significantly higher basal and two hours insulinemia in GG compared to TG and TT genotypes. There was no significant relationship between the polymorphism of SNP45T>G and HDL cholesterol levels. Conclusion: SNP45T>G polymorphism is associated with obesity and hyperinsulinemia in Tunisian population.

## T1:PS.91

**Lauric acid increases IL-6 and decreases adiponectin gene expression in human SGBS adipocytes**

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Dietary lipids influence the composition of adipose tissue, the aetiology of obesity, and the development of obesity-related pathologies such as chronic inflammation. The aim of this study was to examine the effects of the major saturated fatty acids found in coconut and palm oil on the expression of key inflammation-related genes (IL-6, adiponectin) in human adipocytes. Coconut and palm oils are rich in capric (10:0), lauric (12:0) and myristic (14:0) fatty acids; palmitic acid (16:0) is found in palm oil, and in meat and dairy products. **Methods:** SGBS adipocytes were treated after differentiation with 250 µM capric, lauric, myristic or palmitic acids. Further sets of cells were used for time-course and dose-response studies on the effects of lauric acid.

**Results:** IL-6 mRNA level was increased by incubation (24 h) with myristic, lauric and palmitic acids, the largest effect being with lauric acid. IL-6 gene expression in response to lauric acid was increased in a dose-dependent manner (from 125 µM) and was very rapid (within 2 h of treatment). Adiponectin gene expression was increased by treatment with 250 µM myristic acid, but decreased by lauric and palmitic acids. Adiponectin expression in response to lauric acid was decreased in a dose-dependent manner (from as low as 50 µM); it was also rapid, occurring by 4 h.

**Conclusion:** High levels of lauric and palmitic acid, as found in diets rich in coconut and palm oil, may induce an inflammatory state in adipose tissue and impair glucose homeostasis.

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## T1:PS.93

**Correlation between adipocytokines and IL-17, IL-23 and MIF in obese women**

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Visfatin is a newly discovered adipokine found in abundance in visceral fat... Recent studies indicated that visfatin is one of the inflammatory cytokines as it is known for leptin. Obesity is associated with a low-grade inflammation of white adipose tissue resulting from chronic activation of the innate immune system which can subsequently lead to insulin resistance and diabetes. It is still not clear role of acquired immune response in obesity and related comorbidities such as asthma, cancer or autoimmune diseases. The aim of our study was to assess the association between visfatin and leptin levels in circulation and IL-17, IL-23 and MIF (macrophage migration inhibitory factor). In that order, thirty obese women (BMI =35.59±0.83 kg/m<sup>2</sup>, age=35.53±1.59 yrs) 15 healthy control women (BMI=20.43±0.66 kg/m<sup>2</sup>, age=27.87±0.77 yrs) were included in the study. In each of the investigated subjects, following parameters were measured: Visfatin (EIA Phoenix, ng/ml), Leptin (Linco RIA, ng/ml), circulating IL-17, IL-23 and MIF (macrophage migration inhibitory factor, pg/ml). In separate subgroups (obese and control nonobese women) there was no correlation among investigated parameters except between leptin and BMI (r=0.612, p<0.001). In all investigated women (obese + nonobese) using Spearman's correlation analysis significant positive correlation was found between leptin levels and BMI (r=0.844 p<0.001), leptin and IL-17 (r=0.362, p<0.02) and between IL-17 and IL-23 (r=0.506, P<0.05). There was no significant correlation between visfatin and BMI, leptin, IL-17, IL-23 and MIF, respectively. According our results leptin seems to be a better marker of inflammatory state than visfatin in obese women. Positive correlation between IL-17 and BMI suggests further investigation in order to elucidate relationship between acquired immunity and obesity and obesity-related disorders.

## T1:PS.94

## Measures of inflammation in healthy lean and overweight children

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Obese adults have raised levels of circulating inflammatory markers, which may contribute to the development of diabetes and cardiovascular disease; however, results from studies in children are conflicting. In this study we measured inflammatory markers in a longitudinal cohort of lean and overweight healthy children, aged 7 and 14 yrs.

In 1996, 103 (54 males) children were recruited from western Sydney at baseline (7.9 ± 0.6yrs) and at follow-up 7 years later (14.9 ± 0.2yrs). At both time periods, height and weight were measured and serum interleukin (IL)-6 & IL-8 levels determined. Overweight (owt) and obesity (ob) were defined using the International Obesity TaskForce criteria.

Preliminary results show no significant differences in IL-6 (pg/ml) between owt/ob children and lean children at baseline [owt/ob (n=20) median (interquartile range)=2.27 (0.92-3.83); lean (n=60) =1.99 (1.14-3.46)] and follow-up [owt/ob (n=32)= 8.99 (7.85-11.43); lean (n=47)=8.51 (8.18-9.77)]. Similar findings were seen for IL-8 (pg/ml) at baseline [owt/ob (n=20)= 17.3 (8.7-21.7); lean (n=78) =12.6 (8.6-21.7)] and follow-up [owt/ob (n=37)= 23.2 (15.0-29.8); lean (n=65) =20.7 (13.2-27.7)]. There were no correlations between IL-6 and 8 levels and BMI z score at baseline or follow-up.

In contrast to findings in adult studies, this study did not show higher levels of pro-inflammatory cytokines in owt/ob children compared to lean children. Obesity-associated inflammation may exhibit different responses from childhood to adulthood.

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## T1:PS.96

## Plasma proinsulin and leptin levels before and after orlistat 120mg treatment in obese and non-obese young women with polycystic ovarian syndrome

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**Objectives:** To determine if plasma proinsulin and leptin levels in polycystic ovarian syndrome (POS) are different in obese and non-obese women and whether orlistat 120mg treatment improves them independently of body mass index (BMI).

**Patients and methods:** 22 women with POS (aged 20±0.7 years): 9 with normal weight (BMI 21.5±0.7kg/m<sup>2</sup>), 8 overweight (BMI 26.3±0.5), 5 obese (BMI 34.6±2.3). 15 patients had oligomenorrhoea, 7 regular anovulatory menstrual cycles. Fasting proinsulin and leptin were measured before and after 3 months of orlistat therapy (120mg tid). No other treatment of POS was performed.

**Results:** Compared with controls (healthy age-matched women without POS; mean normal proinsulin values=0.7–6.0pmol/l), proinsulin levels before treatment were significantly increased irrespective of weight: with normal weight 13.9±1.9pmol/l, in overweight 14.1±2.3, in obese 21.3±5.8. After treatment, proinsulin decreased significantly in all groups: 8.5±1.2; 8.1±1.2 and 6.9±1.3, respectively (p<0.05).

Leptin concentrations before treatment were significantly decreased in all groups (normal control values=2.9–5.0µg/l): with normal weight 2.1±0.6µg/l, in overweight 1.8±0.6, in obese 2.1±0.2. After treatment, leptin increased significantly in the normal weight group 3.6±0.2µg/l (p<0.05), and in the 2 other groups there was a non-significant increase: 2.4±0.9 and 2.7±1.3, respectively.

In most (16) patients in each of the 3 groups menstrual cyclicity and ovulatory cycle restoration were observed. In addition, pregnancy occurred in one overweight woman.

**Conclusion:** In POS, proinsulin is increased and leptin is decreased independently of BMI. Orlistat 120mg is effective in the improvement of these changes and is a useful adjunct in POS treatment.

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## T1:PS.95

## The +45 T/G variant in adiponectin is associated with obesity in women.

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Adiponectin is an adipocytokine which has been implicated in the pathogenesis of obesity and type 2 diabetes. Several association studies have already found SNPs in this gene to be associated with BMI. We set out to perform an association study with SNPs spread throughout the *APM1* gene to see whether this gene is also involved in the development of obesity in our population.

Six haplotype tagging SNPs were genotyped in 223 premenopausal obese women and 87 female controls. After comparison of the allele frequencies between patients and controls, it was clear that the SNP45 wild-type T allele was more common in patients (89% vs 82 %, p = 0,011). The calculated OR was 1,87 with p = 0,011. None of the other genotyped SNPs showed an allele frequency difference between cases and controls. When looking at haplotypes, we saw that the SNP45/SNP712 haplotype was also significantly associated to obesity in our population (p = 0,004). In order to identify the causative SNP, we performed resequencing on 96 individuals. Resequencing of exon 2, exon 3 and intron 2 did not reveal any SNPs in high LD with SNP45. Therefore, we conclude that SNP45 itself is responsible for the observed association.

In conclusion, we found SNP45 T/G in the *APM1* gene to be significantly associated to obesity in Belgian women. Further functional studies are necessary to elucidate the effect of this SNP on the adiponectin signaling pathway.

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## T1:PS.97

## Obesity is linked with increased clot strength and impaired fibrinolysis in non-alcoholic fatty liver disease.

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Obesity is an independent risk factor for non-alcoholic fatty liver disease (NAFLD). The presence of NAFLD may be linked with further increased cardiovascular risk. We hypothesise that altered clot kinetics and platelet function exist in NAFLD and are associated with obesity and its metabolic consequences. This study compared whole blood clotting kinetics in patients with 1) NAFLD (n=28); 2) obese controls without NAFLD (n=27); and 3) lean healthy controls (n=22). Methods: Clotting kinetics were assessed in whole blood using thromboelastography (TEG). Results: Clot kinetics in patients with NAFLD showed significantly greater clot strength (maximum amplitude (MA); 58.3 ± 6.3mm vs. 52.0 ± 10.1mm, p=0.01) and reduced clot lysis in the presence of t-PA (35 ± 30% vs. 51 ± 26% clot lysis 30 minutes after MA, p=0.03) compared to lean controls. Clot strength was independently associated with body mass index in NAFLD, but not in lean subjects. There was a greater platelet contribution to clot strength in patients with NAFLD compared to lean controls despite similar platelet counts. Conclusion: Patients with NAFLD have disturbances in ex-vivo clot kinetics including increased clot strength and clots that are more resistant to t-PA-stimulated lysis. Changes to clot kinetics in NAFLD are platelet-dependent and not related to the severity of liver injury but rather to the degree of obesity.

**Funding:** Research related to this abstract was funded by a Diabetes Australia Research Trust Grant and National Health and Medical Research Council Australian Clinical Research Postdoctoral Fellowship.

**T1:PS.98****Oleoyl-estrone alters the circulating levels of androgens and estrogens in overweight wistar rats**

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Oleoyl-estrone (OE) increases glucocorticoids and has no significant estrogenicity. In rodents, limited sample size and high cross-reactivity hampers the multiple measurement of steroid hormones through RIA. Application of HPLC-MS/MS methods, using deuterated internal standards solves the problem.

Overweight male Wistar rats were treated with 0.2 mL sunflower oil alone or containing 10µmol/kg/day OE. Plasma samples were supplemented with deuterated standards and then extracted with two sets of organic solvents and analysed by HPLC-MS/MS. To measure estrogen levels, samples were previously derivatized with dansyl chloride in acetone.

OE increased two-fold the basal levels of corticosterone, while dehydrocorticosterone levels increased in a lower proportion, raising their ratio from 9.8 to 11.4. Progesterone levels were under the limit of detection of the method. OE induced a dramatic decrease of both testosterone and androstenedione. Finally, OE increased basal estradiol and estrone levels by factors of x2.2 and x4.4, respectively.

The increase in glucocorticoids agrees with their counter-regulatory effect on OE action. The excess of available estrone due to OE hydrolysis in tissues, is essentially converted to estrone sulphate, but part of the estrone is also converted to estradiol through the 17HSDH activity, which the relatively low estradiol suggests is inhibited by OE. This postulated inhibition results in the dramatic decrease in androgens.

We can conclude that OE action on testosterone and estradiol is probably a consequence of its effect on 17HSDH, probably the result of a protective mechanism against massive estrogenization brought upon by the high estrone availability.

This study was supported by grants from the "Fondo de Investigaciones Sanitarias" and "Plan Nacional de Investigación en Biomedicina", from the Government of Spain

**T1:PS.100****Adiposity associated factors as determinants of desaturase 5 ( $\Delta 5$ ) in Cree people**

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Emerging evidence shows that  $\Delta 5$ (C20:4 n6/ C20:3 n6), the key regulator in the synthesis of highly unsaturated long chain fatty acids (HUFA), is modulated by a variety of factors including adiposity, diet and diabetic condition. We explored the regulation of these factors and their interaction within a high risk Cree population in Quebec, Canada. Fasting blood was taken from adults (98 female, 68 male, 20-88 yr). Anthropometric and blood biochemical measures, including erythrocyte membrane fatty acids, were analyzed.

Obesity is prevalent across age groups in both gender groups (BMI $\geq$ 30: 20-29 yr 58.33%, 30-39yr 71.11%, 40-49 yr 82.76%, 50 yr+ 62.86%). An interaction was observed between fasting glucose status, adiposity and insulin resistance level HOMA. Body fat% is negatively associated with  $\Delta 5$  at both normal fasting glucose ( $r = -.281$ ,  $p < .01$ ) and impaired fasting glucose ( $r = -.291$ ,  $p < .05$ ). HOMA was negatively correlated with  $\Delta 5$  activity ( $r = -.454$   $p < .001$ ) and HUFA omega6 ( $r = -.228$ ,  $p < .05$ ) only at normal fasting glucose status. Surprisingly, age was positively associated with  $\Delta 5$  at both normal and impaired fasting glucose status ( $r > .4$ ,  $P < .001$  for both), but it could be driven by exogenous HUFA since such a pattern was only seen in HUFA omega3 ( $r > .5$ ,  $P < .001$  for both) but not HUFA omega6 ( $P > .05$  at normal fasting glucose).

This study indicates that reduced consumption of fish brought about by dietary transition among younger Cree generations may compound the effects of obesity which could reduce bioavailability of HUFA omega3 (through reduced  $\Delta 5$  activity) and thereby likely aggravate disease risk.

**T1:PS.99****Adiponectin and resistin response in the onset of obesity in male and female rats**

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Adiponectin and resistin are two adipose secreted signals with apparently different, opposite functions regarding the control of insulin sensitivity.

We aimed to study the sex-dependent response of adiponectin and resistin adipose tissue expression and circulating levels in the onset of dietary obesity. Male and female 4-week old Wistar rats were fed a control or cafeteria diet for 15 days. Body weight and energy intake were monitored. Gonadal (visceral), retroperitoneal (visceral) and inguinal (subcutaneous) white adipose tissue (WAT) depots were collected. Serum adiponectin and resistin and tissue mRNA levels were analyzed by Western blot and RT-PCR respectively. Serum levels of insulin, Tumour Necrosis Factor (TNF) alpha, and glucose were measured by ELISA and a glucose sensor. Insulin resistance was assessed by the homeostasis model assessment (HOMA).

Upon cafeteria diet, there was a higher increase in visceral than in subcutaneous fat, especially in females. The effective production of adiponectin and resistin (total levels adjusted per WAT weight) was decreased in the cafeteria groups (more markedly in females for adiponectin) associated with the tendency to lower WAT mRNA levels for resistin but not for adiponectin. Fasting glucose was slightly increased in cafeteria females. HOMA score was not significantly increased by cafeteria feeding, although it tended to be increased in few cafeteria females.

Decrease of WAT adiponectin and resistin effective production seems an early response to obesity development under a high fat (cafeteria) diet, with sex-associated differences. This can probably be related with a physiological role of both adipokines modulating the insulin signalling system.

**T1:PS.101****Decreased plasma leptin levels and lepR expression in the NTS during weight loss-induced compensatory hyperphagia in rats**

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In order to better understand the control of eating by adiposity, we investigated neuroendocrine changes associated with recovery from weight loss. Male Long Evans rats (~350 g) were fed 60% of baseline food intake for two weeks (RF), which produced a weight loss of 71 g vs. ad libitum fed (AL) rats and, when AL was reinstated, 10-14 d of compensatory hyperphagia as body weight renormalized. Expression levels of leptin receptor (lepR) were measured in the arcuate nucleus (Arc) and nucleus of the solitary tract (NTS) by qPCR, and plasma leptin levels by RIA. RF rats had reduced plasma leptin ( $2.7 \pm 0.6$  ng/ml) vs. AL control rats ( $8.4 \pm 1.7$  ng/ml). One d AL refeeding (RF-AL+1) increased RF rats' leptin to  $5.2 \pm 1.5$  ng/ml, although they still weighed 48 g less than AL control rats. NTS LepR mRNA levels were reduced in RF-AL+1 rats vs. both RF and AL controls. Arc lepR levels were similar in all groups. These preliminary data suggest that 1) RF down-regulates leptin signaling in the Arc and NTS by reducing circulating leptin levels without changes in lepR expression, 2) weight-loss induced hypoleptinemia begins to normalize during the first day of compensatory hyperphagia, before normalization of body adiposity, 3) expression levels of NTS lepR, but not Arc lepR, are down-regulated by acute hyperphagia, and 4) reduced leptin signaling in the NTS, but not in the Arc, contributes to weight loss-induced compensatory hyperphagia on RF-AL+1.

## T1:PS.102

**Regulation of desnutrin and adiponutrin protein levels after bilio-pancreatic diversion**

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**Objective:** The aim of this study was to evaluate desnutrin (ATGL) and adiponutrin (ADPN) protein levels in subcutaneous (sc) and visceral (vs) adipose tissue of obese patients, before and after malabsorptive bariatric (bilio-pancreatic diversion, BDP).

**Research Methods and Procedures:** Ten obese women (BMI= 49.4±2.7 kg/m<sup>2</sup>, aged 42±2 years) were studied before and 53±32 months after BPD, when a stable weight was achieved. Sc and vs ATGL and ADPN protein expression was measured by Western blotting. Twenty-four-hour energy expenditure (EE) was measured in a respiratory chamber.

**Results:** After BPD, weight loss (BMI= 32.86±1.81 kg/m<sup>2</sup>, P<0.01), a net improvement of insulin sensitivity (M-value, from 3.15±0.24 to 9.68±0.22 mmol·kg<sup>-1</sup>·min<sup>-1</sup>, P<0.01) and EE decrease (from 12079.63±702.54 to 8255.45±485.70 kJ/24h, P<0.01) were observed. ATGL and ADPN expression in sc adipose tissue significantly decreased, as compared to initial values (83%, P<0.05; 64%, P<0.05; respectively). Changes in ADPN in sc adipose tissue resulted to be significantly correlated with changes in M-value, EE and EE/fat-free mass (FFM) (r=0.719, P<0.05; r=0.775, P<0.01; r=0.716, P<0.05; respectively). A multiple regression analysis (R<sup>2</sup>=0.6, P=0.008) showed that EE represented the most powerful predictor of ADPN decrease after BPD.

**Discussion:** After massive weight loss in obese subjects undergone BPD, ATGL and ADPN protein levels significantly decrease in sc adipose tissue. EE results to be the strongest predictor of ADPN protein decrease. We hypothesize that ATGL and ADPN down-regulation could potentially enhance lipid storage and make additional weight loss more difficult.

## T1:PS.104

**Study of leptin and adiponectin levels in obese and non obese subjects**

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Leptin and adiponectin are adipokines implicated in the pathogenesis of insulin resistance. The aim of the study was to evaluate the relationship between insulin, leptin and adiponectin and obesity in our population. Subjects and methods: the study concerned 315 obese (sex-ratio= 0.45, mean age 42.6 ±12.6 years) and 320 non obese control subjects (sex-ratio= 1.01, mean age 49.3± 9.6 years). Each subject underwent a physical examination and biological investigations (basal and two hours blood glucose and insulinemia, total cholesterol, triglycerides, HDLc, leptin and adiponectin). Results: Obese subjects had significantly higher levels of fasting blood glucose (1.19±0.52 vs 0.94±0.30g/l, p<0.001), basal insulin (12.5±9.8 vs 5.0±5.0 µU/l, p<0.001) and leptin (20.9±10.9 vs 6.1±4.9 ng/ml, p<0.001) and significantly lower levels of adiponectin (4.4 ±3.5 vs 11.3±17.3µg/ml, p<0.001). The ratio leptin/adiponectin was significantly higher in obese. Conclusion: the study confirms the fact that leptin and adiponectin levels are good indicators of weight excess.

## T1:PS.103

**The auditory evoked potentials usage in depth of anesthesia monitoring during bariatric surgery. Preliminary rapport.**

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**Background:** One of the latest continues consciousness state monitoring methods during general anaesthesia is auditory evoked potentials (AEP) registration in the AAI (A-line Arx Index) scale. The MEDLINE database was searched electronically for articles for the period of 1980 through October 2007 and we did not find any rapport of AEP usage during bariatric surgery procedures.

**Patients and methods:** Our group enclosed 15 patients (27-54 years, BMI- 49±6 kg/m<sup>2</sup>) prepared for bariatric surgery. The consciousness level measurement with AEP (AEP monitor/2 version 1, 61, Danmeter A/S, Denmark). Sedation was performed with propofol TCI (Target Controlled Infusion) 3-6 mcg/ml and analgesia with fentanyl. Servin's weight correction formula was adopted for propofol dosage maintenance. We evaluated: consciousness level – AAI scale, influence of muscular tone and surgical electrocoagulation on AAI, time to extubation and TCI value during extubation.

**Results:** Level of AAI correlated with clinical depth of sedation and enabled to maintain proper dosage of propofol. The interdependence between AAI elevation and muscular strength return or surgical electrocoagulation during abdominal wall dissection were stated. In all patients the consciousness return based on AAI was adequate to clinical status and TCI value. The mean value of propofol effect site concentration during extubation was 2,08±0,36 mcg/ml. The mean time to extubation were 12,69±4,39 min.

**Conclusions:**

1. The depth of anaesthesia monitoring during VBG or RYGB enables to adopt TCI propofol dosage.
2. The muscular action and surgical electrocoagulation create changes in AAI reading.
3. The adequate AAI level secures the intraoperative amnesia.

## T1:PS.105

**Cannabinoid receptor expression in human adipose tissue – the endocannabinoid system and inflammation**

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The endocannabinoid system (ECS), commonly associated with the stimulation of appetite, has been recently linked with inflammation. There are two major cannabinoid receptors, CB1 and CB2, while both TRPV1 and GPR55 have been considered as putative third receptors. The aim of this project is to examine whether the ECS plays an important regulatory role in the inflammatory process in white adipose tissue.

RT-PCR was used to define the expression of the ECS receptors in different cell types within adipose tissue. The regulation of the expression of the receptors was then examined in primary human adipocytes (Zen Bio) by real-time PCR. Firstly, a differentiation time course showed an increase in CB1, TRPV1 and CB2 mRNA levels of 500-fold, 30-fold and 5-fold, respectively, at day 3 post-induction relative to preadipocytes. In contrast, GPR55 was mainly expressed in preadipocytes. Macrophages (U937) expressed all four cannabinoid and putative cannabinoid receptors. TNF $\alpha$  treatment of the adipocytes downregulated CB1 gene expression by more than 8-fold (at 24 h), and rosiglitazone treatment by 2-fold; dexamethasone induced a 4-fold diminution in TRPV1 mRNA level. Under hypoxic conditions, adipocytes exhibited decreases in CB1 (2-fold) and TRPV1 (3-fold) mRNA levels. Western blotting was used to verify expression of the protein in parallel with the receptor mRNA.

It is concluded that CB1 expression in adipocytes is influenced by inflammation-related agents, which may indicate that this key cannabinoid receptor could be a target for the pharmacotherapy of inflammatory events within adipose tissue.

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## T1:PS.106

**Molecular mechanisms involved in resistin-induced activation of human endothelial cells**

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**Objectives:** Resistin is an adipokine/cytokine, recently reported to induce vascular endothelial cell dysfunction; however, the molecular mechanisms involved are not understood, yet. In this study, we evaluated the molecular mechanisms of resistin-induced activation of human endothelial cells (HEC) by comparison with TNF- $\alpha$ .

**Methods:** The HEC were incubated either with 50 to 100 ng/ml human resistin (R) or TNF- $\alpha$  (10ng/ml) or resistin and TNF- $\alpha$  (R+T) for 6 or 18hours and the expression of cell adhesion molecules, ICAM-1 and P-selectin and of chemokine, fractalkine was assessed by Elisa assay and Western blot. To identify resistin downstream signaling pathways the activation of p38, JNK and ERK MAPK and of the transcription factors NF- $\kappa$ B and AP-1 was determined (Western blot).

**Results:** (a) Resistin and TNF- $\alpha$  up-regulated at similar levels P-selectin and fractalkine; also, resistin up-regulated the expression of ICAM-1 but at a lower level than TNF- $\alpha$ . (b) R+T had a similar effect on P-selectin and fractalkine as resistin or TNF- $\alpha$  alone but reduced ICAM-1 expression when compared with the effect induced by TNF- $\alpha$ . (c) R and R+T induced activation of p38 MAPK, ERK and of AP-1 and NF- $\kappa$ B in HEC. (d) The effect of resistin on the cell adhesion molecules and chemokine expression was inhibited by the anti-inflammatory agent, curcumin.

**Conclusion:** resistin has proinflammatory effects in human endothelial cells by up-regulating the expression ICAM-1, P-selectin and of fractalkine by a mechanism involving MAPK and NF- $\kappa$ B and AP-1.

The study was supported by the Romanian Academy and a grant from The Romanian Ministry of Education and Research

## T1:PS.108

**Thrombin modulates lipolysis and inflammatory cytokine release in human adipose**Strande JL<sup>1</sup>, Phillips SA<sup>1,2</sup><sup>1</sup>Medical College of Wisconsin, Milwaukee, USA; <sup>2</sup>University of Illinois, Chicago, USA

Previous studies indicate thrombin is elevated in obesity. The inflammatory molecules produced by adipose contribute to the development of insulin resistance and cardiovascular disease. Therefore, the purpose of this study was to test the hypothesis that human adipose express thrombin receptors (PAR1 and PAR4) and that thrombin stimulates a lipolytic and inflammatory cytokine response in human adipose predictive of cardiovascular risk.

**Methods:** Human adipose were dissected and minced for whole tissue (AT) assays or digested for pre-adipocyte (PA) isolation. Pre-adipocytes were maintained in culture or differentiated into adipocytes (AD). PAR1 and PAR4 mRNA and protein were detected by RT-PCR and immunoblot analysis. IL-1, IL-6, IL-10, FGF-2, VEGF, PDGF and lipolysis (glycerol production) were measured from AT (n=5), AD (n=6), and PA (n=3) supernatants after thrombin (10 U/ml; 24 hrs) treatment.

**Results:** Thrombin stimulated lipolysis in AT (17%, p=0.01) cultures but not AD (10%, p=0.08). Thrombin increased the secretion of all cytokines in AT, AD, and PA cultures (P<0.05) for IL-1 (AT: 195 $\pm$ 74% and AD: 616 $\pm$ 341%), IL-6 (AD: 3100 $\pm$ 1400%), IL-10 (AD: 158 $\pm$ 79%) FGF-2 (AD: 195 $\pm$ 106%), PDGF (AD: 198 $\pm$ 28% and PA 635 $\pm$ 131), and VEGF (AD: 401 $\pm$ 96% and PA: 634 $\pm$ 131%). The direct thrombin inhibitor lepirudin prevented thrombin-mediated cytokine release.

**Discussion:** These data indicate that thrombin PAR1 and PAR4 receptors are present and that thrombin stimulates lipolytic function in human adipose. Thrombin induces the secretion of pro and anti-inflammatory cytokines and growth factors in adipocytes. Therefore, thrombin alters metabolism, inflammatory cytokine release, and may contribute to the chronic inflammation associated with obesity.

**Funding:** Dr. Strande is supported by an NIH training grant (HL07792)

## T1:PS.107

**The effect of weight loss on inflammatory adipocytokine levels and insulin sensitivity in obese women**Mitic, D<sup>1</sup>, Sumarac-Dumanovic<sup>1</sup>, M, Stamenkovic-Pejkovic, D<sup>1</sup>, Simic, M<sup>1</sup>, Cvijovic, G<sup>1</sup>, Zoric, S<sup>1</sup>, Kendereski, A<sup>1</sup>, Stevanovic, D<sup>1</sup>, Jorga J<sup>1</sup> and Trajkovic, V<sup>4</sup>.<sup>1</sup>Institute of Endocrinology, Diabetes and Diseases of Metabolism, Clinical Center of Serbia, Belgrade, Serbia<sup>2</sup>Institute of Physiology, Medical Faculty, Belgrade, Serbia<sup>3</sup>Institute of Nutrition, Medical Faculty, Belgrade, Serbia<sup>4</sup>Institute of Microbiology and Immunology, Medical Faculty, Belgrade, Serbia

Recent reports indicate evidence about existing of low-grade inflammation in obesity. It was postulated that different corrective therapeutic maneuvers could interfere with the markers of inflammation in this disease. The aim of our study was to evaluate changes in pro-inflammatory and anti-inflammatory adipocytokines and cytokines, CRP and insulin sensitivity after 10% reduction of body weight in obesity. In that order, 10 obese women (BMI at start =36.59 $\pm$ 0.84 kg/m<sup>2</sup>, age=37.53 $\pm$ 1.59 yrs, BMI after reduction body weight 31.86 $\pm$ 1.84 kg/m<sup>2</sup>) were investigated twice, before and after 10% reduction of body weight achieved with lifestyle changes and hypocaloric diet. Following parameters were measured before and after weight reduction: leptin (Linco RIA, ng/ml), visfatin (EIA Phoenix, ng/ml), adiponectin (Linco RIA, ng/ml), fasting glycemia (mmol/l), fasting insulin (RIA, Inep, mU/l), CRP (mg/L), MIF (macrophage migration inhibitory factor, pg/ml) and HOMA-IR as marker of insulin resistance. There was a significant reduction in leptin levels (36.53 $\pm$ 8.11 vs. 19.82 $\pm$ 3.17, p<0.05) and improvement in HOMA index (2.75 $\pm$ 0.31 vs. 2.00 $\pm$ 0.27, p<0.05). MIF was also significantly reduced 4923.25 $\pm$ 2021.92 vs. 1372.12 $\pm$ 540.81, p<0.05). There were no significant changes in visfatin (78.06 $\pm$ 4.76 vs. 78.36 $\pm$ 9.38, p<0.05), adiponectin (5.51 $\pm$ 2.26 vs. 8.63 $\pm$ 2.49, p>0.05) and CRP levels (4.44 $\pm$ 1.38 vs. 5.06 $\pm$ 1.70, p>0.05). In conclusion, reduction of 10% body weight is capable of partial reversing the low-grade inflammation in female patients with obesity.

## T1:PS.109

**Do anthropometric parameters have any effect on the evaluation of prostate cancer?**Serin, E<sup>1</sup>, Kandirali, E<sup>2</sup>, Boran, C<sup>3</sup><sup>1</sup>Abant Izzet Baysal University, Izzet Baysal Medical Faculty, Dep. of Biochemistry, Bolu, Turkey<sup>2</sup>Abant Izzet Baysal University, Izzet Baysal Medical Faculty, Dep. of Urology, Bolu, Turkey<sup>3</sup>Abant Izzet Baysal University, Izzet Baysal Medical Faculty, Dep. of Pathology, Bolu, Turkey

**Background:** Obesity has been found to be associated with occurrence and mortality of prostate cancer (PCa), but the relationship of body mass index(BMI) with PCa risk remains controversial across different populations and the epidemiological data on the incidence of PCa in obese and non-obese populations are conflicting.

**Aim:** To observe the relationship of BMI and waist-to-hip ratio (WHpR) with predictability of PCa and benign prostate hypertrophy (BPH) in men 50 years or older.

**Subjects and methods:** Weight, height, hip and waist circumference of 120 male patients aged 50 years or older were measured. WHpR and BMI were computed. Prostate specific antigen(PSA) and free PSA(fPSA) status and the prostate volumes were determined. All of the patients underwent prostate biopsies and 47 patients were diagnosed as having PCa and the remaining 73 were diagnosed as BPH. Mean anthropometric indices were compared between groups using one-way ANOVA test.

**Results:** There was no statistical significance in BMI and WHpR between the two groups (p=0.69, p=0.49, respectively). There was a statistical significance in age, PSA, fPSA, and prostate volumes between the two groups (p=0.02, p<0.001, p=0.04, and p=0.04, respectively).

**Conclusion:** Neither central adiposity nor the BMI seem to be important predictors of increased risk of PCa in men aged 50 years and older. There is need to investigate with greater numbers of patients with PCa and BPH to find out the effect of central adiposity or the BMI on risk of developing PCa.

## T1:PS.110

**Effect of PPAR gamma agonist, antagonist and beta3 agonist/antagonist on adiponectin, resistin, NO, TNF-alfa and lipolysis in rat adipocytes**

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Recent trend in treatments of metabolic syndrome includes; glitazones and potential new drugs for obesity as beta3 agonists. We try to shed light on the relationship between PPARgamma, beta3 signaling, lipolysis, insulin resistance, inflammation marker TNF-alfa and the release of NO. Epididymal rat adipocytes were isolated and cultivated with troglitazone, SR202 (PPARgamma antagonist), BRL-37344 (beta3 agonist), SR 59230A (beta3 antagonist) in combinations. After 24 and 72 hours, culture media were analyzed via ELISA for adiponectin as insulin sensitivity marker, resistin as insulin resistance marker and TNF-alfa. Glycerol (lipolysis) and NO<sub>2</sub> (NO oxidative product) levels were assessed.

Lipolysis was decreased after glitazone and SR-202 and the beta3 agonist-induced lipolysis was blocked by glitazone/glitazone +SR-202 application. Resistin and adiponectin reacted as expected to glitazone addition (adiponectin increased, resistin decreased) after more than 24 h incubation. However, adiponectin level paradoxically decreased after 24 hours but increased more than control after 72 hours. Moreover, BRL-37344 produced remarkable increase of resistin being attenuated by glitazone/SR-202 and/or SR 59230A. NO exhibited increasing trend after troglitazone/SR-202 and in combination with BRL-37344. BRL-37344 effect on NO is partially attenuated by addition of glitazone/SR-202 or SR 59230A. None of the agent had significant influence on TNF-alfa levels. The interplay between PPARgamma agonist/antagonist and beta3 agonist/ antagonist signaling on NO release, insulin-resistance, TNF-alfa and lipolysis was evaluated. The beta3 agonist BRL-37344, as potent lipolysis agent, increases resistin levels. The time dependence of adiponectin secretion in response to troglitazone is demonstrated. Supported by IGA MZ NR/9379-3/2007, VZ MSM 0021620807

## T1:PS.112

**Retinol binding protein 4 and visfatin in rat obesity models**

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Retinol binding protein 4 (RBP4) and visfatin are adipocyte-secreted proteins (adipokines) whose relevance to the metabolic syndrome remains controversial. We assessed changes in RBP4 and visfatin serum levels and adipose tissue expression in both a genetic and a diet-induced model of obesity in the rat (obese *fa/fa* Zucker rats and Wistar rats fed a cafeteria diet, respectively). Compared to lean controls, obese *fa/fa* rats were hyperleptinemic, hyperinsulinemic and insulin resistant and had reduced RBP4 serum levels and mRNA levels in adipose depots, unchanged visfatin serum levels and reduced visfatin mRNA levels selectively in the inguinal adipose depot. Cafeteria diet-induced obesity resulted in increased fed blood glucose levels, a variable degree of insulin resistance, unchanged serum visfatin and RBP4 levels, and reduced mRNA levels of both adipokines in several adipose depots. Hence, increases of RBP4 or visfatin do not accompany obesity and insulin resistance in the models examined.

## T1:PS.111

**Increased high molecular weight adiponectin after bariatric surgery-induced weight loss**Linscheid, P<sup>1,3</sup>, Christ-Crain, M<sup>1,2</sup>, Stöckli, R<sup>1,2</sup>, Reusch, R<sup>3</sup>, Lutz, T<sup>4</sup>, Müller, B<sup>1,2</sup>, Keller U<sup>1,2</sup>

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**Background:** Concentrations of circulating adiponectin, particularly the high molecular weight (HMW) multimeric form, are negatively associated with obesity and insulin resistance. The molecular mechanisms regulating adiponectin production are unknown and there is controversy regarding the role of adiponectin during weight loss.

**Methods:** Plasma samples were obtained from 13 morbidly obese subjects (BMI > 37 kg/m<sup>2</sup>) at baseline and 3, 6, 12 and 24 months after weight loss induced by bariatric surgery (i.e., Roux-en-Y gastric bypass or gastric banding). Seven matched obese subjects without surgical intervention and served as controls. Total and multimeric adiponectin concentrations were determined with a commercial kit (EK-MADP Multimeric Adiponectin ELISA Kit, BÜHLMANN Laboratories AG, Schönenbuch, Switzerland). In addition, adiponectin multimers were detected by native SDS-PAGE and western blotting.

**Results:** 3, 6, 12 and 24 months after surgery, the respective increase in total adiponectin was 0.63 ± 0.27 µg/mL, 0.99 ± 0.23 µg/mL (P < 0.05), 1.7 ± 0.39 µg/mL (P < 0.05) and 2.2 ± 0.46 µg/mL (P < 0.05), respectively. At the same time points, the increase in HMW adiponectin was 0.25 ± 0.21 µg/mL, 0.43 ± 0.16 µg/mL, 1.1 ± 0.27 µg/mL (P < 0.01), 1.4 ± 0.3 µg/mL (P < 0.01). In contrast, the plasma concentrations of low and middle molecular weight adiponectin remained unchanged. The HMW-specific increase in adiponectin was confirmed by Western blot analysis.

**Conclusion:** Pronounced weight loss increases HMW adiponectin, but not the other multimeric forms. Future studies will clarify the role of HMW adiponectin in weight loss-induced metabolic improvements.

## T1:PS.113

**Adiponectin protects against cardiac fibrosis but not the formation of atherosclerotic lesions in LDL receptor deficient mice**Nawrocki, AR<sup>1</sup>, Hofmann, SM<sup>2</sup>, Teupser, D<sup>3</sup>, Basford, JE<sup>3</sup>, Rickes, EL<sup>1</sup>, Tanowitz, HB<sup>4</sup>, Chang, CH<sup>1</sup>, Hui, DY<sup>5</sup>, and Scherer, PE<sup>2</sup><sup>1</sup> Merck Research Laboratories, Rahway, NJ, USA<sup>2</sup> University of Cincinnati College of Medicine, Cincinnati, OH, USA<sup>3</sup> University Hospital Leipzig, Germany<sup>4</sup> Albert Einstein College of Medicine, Bronx, NY, USA<sup>5</sup> University of Texas Southwestern Medical Center, Dallas, TX, USA

Adiponectin is a fat derived factor implicated in the protection against a cluster of related metabolic disorders including obesity, dyslipidemia, insulin resistance and cardiovascular disease. Mice lacking adiponectin display impaired hepatic insulin sensitivity and respond only partially to PPARgamma agonists. Adiponectin-mediated metabolic improvements are related to the prevention of ectopic lipid deposition and alleviation of dyslipidemia. A modest increase in circulating adiponectin levels leads to an activation of PPARgamma targets and reduction of liver steatosis at the expense of a massive expansion of adipose tissue in ob/ob mice. To study whether the ameliorated lipoprotein profile affects the formation of atherosclerotic lesions, we crossed mice over-expressing adiponectin with LDL-R receptor deficient (LDLR KO) mice. Although these mice have reduced triglyceride-rich lipoprotein and cholesterol levels, the amount of atherosclerosis is unaffected. Surprisingly, increased adiponectin levels are not sufficient to prevent or delay the accumulation of cholesterol in the aortic walls or to reduce plaque volume in the aortic root. A similar phenotype is observed in LDLR KO mice that are adiponectin deficient. A cholesterol rich diet leads to substantial atherosclerosis, albeit the lack of adiponectin does not accelerate the process. In both cases the phenotype may reflect a limitation related to rodent models. Nonetheless, adiponectin visceral obesity has been suggested to be an independent risk factor for cardiovascular disease (CVD); the role of adipokines in the risk for CVD is less clear. This study was performed to test the predictive value of anthropometric parameters, adipokines and visceral obesity for the risk of CVD.

A cross-sectional analysis of apparently healthy males (n=116) and females (n=175) for evaluation of clinical, laboratory, and anthropometric parameters was undertaken. Abdominal subcutaneous and visceral adipose tissues (SAT and VAT) were measured by computed tomography. Adipokines, including retinol binding protein (RBP) 4 and adiponectin, were also determined. The risk for CVD was estimated using the 10-year Framingham Coronary Heart Disease Risk Point scale (10-y FCRP).

All features studied contributed to the morbidity associated with an increase in VAT. The 10-y FCRP was significantly correlated with VAT ( =0.123, P=0.049) and RBP4 ( =0.230, P<0.001), after adjustment for age, gender and BMI. The magnitude of the increased 10-y FCRP correlated with VAT and RBP4 independent of obesity. In a multiple linear regression model, the serum levels of RBP4 at a given BMI and VAT significantly correlated with the 10-y FCRP ( =0.123, P<0.001).

does exert major cardioprotective effects leading to a significant reduction of tissue fibrosis in the heart of LDLR KO mice. This suggests that the actions of adiponectin on the cardiovascular system are complex and at multifaceted, with a minimal direct impact on atherosclerotic plaque formation in the murine model.

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## T1:PS.114

**Risk of cardiovascular disease in healthy individuals is closely related with increased plasma levels of retinol binding protein 4 and visceral adiposity independent of obesity.**Park CY<sup>1</sup>, Won JC<sup>1</sup>, Oh SW<sup>2</sup>, Yoon YS<sup>3</sup>, Ko JA<sup>4</sup>, Lee CB<sup>5</sup>, Kim SR<sup>6</sup><sup>1</sup>Sungkyunkwan University School of Medicine, Seoul, Korea, <sup>2</sup>Dongguk University International Hospital, Kyunggi, Korea, <sup>3</sup>Inje University College of Medicine, Kyunggi, Korea, <sup>4</sup>Seoul National University Hospital, Seoul, Korea, <sup>5</sup>Hanyang University, Kyunggi, Korea, <sup>6</sup>The Catholic University, Kyunggi, Korea

VAT and RBP4 were closely associated with the 10-y FCRP. RBP4 appears to provide a link between central obesity and CVD.

Visceral obesity has been suggested to be an independent risk factor for cardiovascular disease (CVD); the role of adipokines in the risk for CVD is less clear. This study was performed to test the predictive value of anthropometric parameters, adipokines and visceral obesity for the risk of CVD.

A cross-sectional analysis of apparently healthy males (n=116) and females (n=175) for evaluation of clinical, laboratory, and anthropometric parameters was undertaken. Abdominal subcutaneous and visceral adipose tissues (SAT and VAT) were measured by computed tomography. Adipokines, including retinol binding protein (RBP) 4 and adiponectin, were also determined. The risk for CVD was estimated using the 10-year Framingham Coronary Heart Disease Risk Point scale (10-y FCRP).

All features studied contributed to the morbidity associated with an increase in VAT. The 10-y FCRP was significantly correlated with VAT ( $\gamma=0.123$ ,  $P=0.049$ ) and RBP4 ( $\gamma=0.230$ ,  $P<0.001$ ), after adjustment for age, gender and BMI. The magnitude of the increased the 10-y FCRP correlated with VAT and RBP4 independent of obesity. In a multiple linear regression model, the serum levels of RBP4 at a given BMI and VAT significantly correlated with the 10-y FCRP ( $\beta=0.123$ ,  $P<0.001$ ).

VAT and RBP4 were closely associated with the 10-y FCRP. RBP4 appears to provide a link between central obesity and CVD.

## T1:PS.116

**Relation between plasma levels of adiponectin, cardiometabolic risk factors and adiponectin gene expression in visceral adipose tissue, in a group of severely obese patients**Sirbu A<sup>1,2</sup>, Barbu C<sup>1,2</sup>, Reghina A<sup>2</sup>, Munteanu C<sup>3</sup>, Kervorkian S<sup>3</sup>, Copacescu C<sup>4</sup>, Nicolae H<sup>1,2</sup>, Florea S<sup>2</sup>, Fica S<sup>1,2</sup><sup>1</sup>Carol Davila University of Medicine and Pharmacy, Bucharest, Romania<sup>2</sup>Elias University Hospital, Bucharest, Romania<sup>3</sup>Multiple Users Clinical Base, Faculty of Biology, Bucharest University, Bucharest, Romania<sup>4</sup>Sf. Ioan Emergency Hospital, Bucharest, RomaniaThe **aim** of this study was to evaluate the relation between adiponectin and cardiometabolic risk factors and cardiovascular complications, as well as the link between plasma levels of adiponectin and expression of adiponectin gene in visceral adipose tissue, in a group of obese patients.**Patients and methods:** 40 patients with severe obesity were evaluated. The assessment included clinical parameters (waist, BMI) and paraclinical (lipid profile, HOMA-R index) tests, as well as determination of plasma adiponectin level (ELISA method). Common carotid intima-media thickness (IMT) was bilaterally evaluated by Doppler ultrasound (UF 850XTD Tellus). Visceral adipose tissue was obtained during bariatric surgery and we quantified the variation of expression of adiponectin gene (by RT-PCR, using HPRT as reference gene). Patients were divided in 2 groups: with (26) and without (14 patients) metabolic syndrome (Mets)**Results:** Plasma adiponectin levels were lower in metabolic syndrome patients ( $15.57\pm 6.73$  vs  $18.54\pm 7.04$  ng/ml). There was a positive correlation between adiponectin and HDL levels ( $r=0.603$ ,  $p<0.01$ ) and a negative correlation with waist circumference, triglycerides ( $r=-0.3$ ) and HOMA index ( $r=-0.21$ ,  $p<0.05$ ). In patients with MetS there was a significant negative correlation between adiponectin levels and common carotid IMT ( $r=-0.44$ ,  $p<0.05$ ). Adiponectin expression in visceral adipose tissue correlates with plasmatic levels ( $r=0.33$ ).**Conclusion:** Our results prove the existence of a significant relation between low plasma adiponectin levels and metabolic risk factors, as well as vascular complications. Visceral obesity role in the pathogeny of these changes is sustained by the correlation between adiponectin expression in visceral adipose tissue and its serum levels.

## T1:PS.115

**Tenomodulin is highly expressed in human adipocytes, down regulated during diet and increased in obesity**Saiki, A<sup>1</sup>, Svensson, PA<sup>1</sup>, Gummesson, A<sup>1</sup>, Goedecke, JH<sup>2</sup>, Jernås, M<sup>1</sup>, Andersson, J<sup>1</sup>, Jacobson, P<sup>1</sup>, Sjöholm, K<sup>1</sup>, Sjöström, L<sup>1</sup>, Carlsson, L<sup>1</sup><sup>1</sup>Department of Molecular and Clinical Medicine, Institute of Medicine, Sahlgrenska University Hospital, Göteborg, Sweden<sup>2</sup>UCT/MRC Research Unit for Exercise Science and Sports Medicine, Department of Human Biology, Faculty of Health Sciences, University of Cape Town, Cape Town, South Africa**Purpose:** Tenomodulin (TNMD) is considered to be a putative angiogenesis inhibitor and polymorphisms in the TNMD gene have been reported to be associated with obesity. Our aim was to investigate TNMD gene expression in human adipose tissue and adipocytes.**Methods:** Microarray expression profiles from 65 human tissues and adipocytes were used to investigate TNMD tissue distribution. TNMD expression in adipose tissue from lean and obese subjects, and during diet-induced weight reduction (very-low-calorie diet, 450 kcal / day for 16 weeks) in obese subjects was analyzed by microarray.**Results:** TNMD expression in adipocytes was more than 6-fold higher compared to the non-adipose tissues. TNMD expression in obese subjects was more than 2.5-fold higher than in lean subjects ( $p < 0.001$ ). TNMD expression in subcutaneous adipose tissue was 6.3-fold ( $p = 0.024$ ) and 3.2-fold ( $p = 0.002$ ) higher than in visceral adipose tissue among lean subjects and obese subjects, respectively. TNMD expression in adipose tissue was down regulated by diet-induced weight loss ( $p < 0.0001$ ), and the change of TNMD expression in adipose tissue positively correlated to the change of body mass index ( $r = 0.70$ ,  $p < 0.0001$ ).**Conclusion:** These results suggest that TNMD is highly expressed in adipocytes and the expression is strongly associated with obesity. The function and significance of TNMD in obesity remains to be determined.

## T1:PS.117

**Interplay between macrophages and adipocytes: stimulation of secretion of adipokines and the role of endocannabinoids**Wortelboer, HM<sup>1</sup>, Lancee, CAA<sup>1</sup>, Meijerink, J<sup>2</sup>, Witkamp, RF<sup>1,2</sup><sup>1</sup>TNO Quality of Life, Zeist, the Netherlands<sup>2</sup>Wageningen University, Division of Human Nutrition, Wageningen, The NetherlandsThe concept of a chronic low-grade inflammatory status of adipose tissue during obesity is now widely accepted. This condition is regarded as a major driver for the development of cardiovascular- and diabetic complications. Macrophage recruitment and -activation is pivotal for the inflammatory process, and the different cell types and forms are involved in a complex interplay. We are investigating the regulation of intercellular communication, with special emphasis on the role of cannabinoid type-1 receptor (CB1) and CB2 mediated pathways. In order to study the effects of macrophage-secreted factors on adipocytes, 3T3-L1 adipocytes were incubated with lipopolysaccharide (LPS) or different RAW264.7 macrophage conditioned media. The release of adipokines by 3T3 cells was measured by multiplex immunoassay. Macrophage-LPS stimulated conditioned medium enhanced the adipokine secretion of especially MCP-1, PAI-1 and adiponectin, whereas release of IL-6 was lower as compared to LPS treatment. No effect on TNF- $\alpha$  secretion was observed. Moreover, an enhanced secretion of MCP-1 and PAI-1, but not IL-6, was measured after treatment with macrophage-stimulated conditioned medium (in absence of LPS). Macrophage conditioned medium but not LPS also increased lipolysis in 3T3-L1 cells. When studying the effects of CB1 and CB2 agonists on macrophages and adipocytes, no effects were seen so far on the TNF- $\alpha$ , IL-6 or IL10 secretion by macrophages stimulated with LPS. We are currently studying other ways of macrophage activation. By contrast, the cannabinoid agonist HU210 induced a 3-fold induction of triglyceride content without affecting adiponectin mRNA levels.

## T1:PS.118

**Polymorphism on leptin gene promoter in the position -2549 affects the probability to develop obesity in normal weight volunteers**Bressan, J<sup>1</sup>, Coelho, S B<sup>1</sup>, Costa, N M B<sup>1</sup>, Alfenas, R C G<sup>1</sup>, Mattes, RD<sup>2</sup><sup>1</sup>Universidade Federal de Viçosa, Viçosa, MG, Brazil<sup>2</sup>Purdue University, West Lafayette, IN, USA

This study evaluated whether polymorphisms on leptin gene promoter and leptin receptor gene regulatory regions influence appetite and hormonal responses following peanut consumption and if hormonal responses are different after consumption of other foods with similar energy content and macronutrient distribution.

Sixty participants were divided into 3 groups (PG: peanut, MG: mix and PMG: peanut + mix). Each participant completed 4 sessions. Appetite, anthropometric indices, body composition, physical activity and dietary intake were monitored during sessions. Plasma leptin, ghrelin and insulin concentrations as well as leptin and leptin receptor gene polymorphisms were analyzed in a subsample of 30 volunteers.

No treatment effects were observed on hormone concentrations. No polymorphism was found for the regulatory region of leptin receptor gene. However, for the promoter of leptin gene in the -2549 position, 50% of volunteers had one polymorphic allele and 13% had a polymorphism in both alleles. These individuals presented smaller body fat mass, leptin and ghrelin plasma concentrations and also fullness ratings. They also had higher hunger, desire to eat, and desire to eat something sweet and salted ratings. This study suggests that peanuts exerted no unique effect on appetite or selected satiety hormone response. Individuals with polymorphic allele carriers for leptin gene promoter in the -2549 position in both alleles may have a higher probability for developing obesity due to lower plasma leptin concentrations, higher hunger rates, lower fullness rates and stronger desire to eat sweet foods.

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## T1:PS.120

**Effect of gastric bypass on serum rbp4 concentrations: relevance of body fat reduction over weight loss and improved insulin sensitivity**Gómez-Ambrosi, J<sup>1,5</sup>, Rodríguez, A<sup>1,5</sup>, Catalán, V<sup>1,5</sup>, Ramírez, B<sup>1,5</sup>, Silva, C<sup>2,5</sup>, Rotellar, F<sup>3,5</sup>, Gil, MJ<sup>4,5</sup>, Salvador, J<sup>2,5</sup>, Frühbeck, G<sup>1,2,5</sup>

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**Introduction:** The aim of the present study was to compare serum RBP4 in lean and obese patients with or without T2DM, and to analyse the effect of weight loss.

**Patients and methods:** Forty-two Caucasian subjects were included in the study. Serum RBP4 was measured by ELISA and Western blot. In addition, serum RBP4 was measured in 21 morbidly obese patients before and 4, 8 and 15 months after Roux-en-Y gastric bypass (RYGBP).

**Results:** No significant effect of either obesity or diabetes on serum RBP4 was observed. Serum RBP4 concentrations (measured by either ELISA or Western blot) did not correlate with BMI, body fat or any indicator of glucose metabolism or insulin resistance. Weight loss following RYGBP did not modify serum RBP4 at 15 months ( $P=0.472$ ). However, the variations in serum RBP4 were significantly associated with the reduction in body fat ( $r=0.48$ ;  $P=0.026$ ). Patients losing over 20% of fat mass ( $n=11$ ) showed significantly different RBP4 concentrations compared to those individuals exhibiting smaller adiposity reductions ( $n=10$ ) ( $-11.0\pm 6.4$  vs  $+5.8\pm 3.6$  mg/l;  $P=0.036$ ). Furthermore, RBP4 levels were significantly reduced at 4 ( $P=0.006$ ) and 8 ( $P=0.015$ ) months only in those patients losing over 20% of fat mass.

**Conclusion:** Serum RBP4 concentrations are not increased in obese patients with or without T2DM. A decrease in RBP4 levels was only observed after surgically-induced weight loss accompanied by relevant reductions in body fat. RBP4 might be considered as a dynamic marker of negative energy balance being reduced during weight loss only when a certain negative energy balance threshold is reached.

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## T1:PS.119

**Regulation of adipose and hepatic interleukin-18 and caspase-1 in obesity**

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The proinflammatory interleukin-18 (IL-18) is elevated in plasma of obese and type-2 diabetic subjects and might participate in the development of these metabolic disorders. In the present study we compared the expression of IL-18 and caspase-1, the key enzyme responsible for active IL-18 production, in adipose tissue and in liver of ob/ob mice and in mice fed a high fat diet (HFD) compared with ob/+ mice and mice fed a chow diet, respectively. Compared with ob/+ mice, the ob/ob mice displayed a 2-fold higher level of circulating IL-18, which was associated with a 4-fold increase in IL-18 protein expression in adipose tissue, but only a slight increase (1.3-fold;  $p<0.05$ ) in hepatic IL-18 protein level. There were no changes in circulating, adipose and hepatic IL-18 protein levels in HFD mice, compared with lean animals. Surprisingly, in ob/ob mice the marked induction of IL-18 protein in adipose tissue was associated with a decrease (1.6-fold;  $p<0.05$ ) of its mRNA expression. However, caspase-1 mRNA expression and its activity were significantly induced in fat pads of ob/ob mice. In liver of both mouse models of obesity, IL-18 and caspase-1 mRNA expressions were slightly enhanced whereas caspase-1 activity was reduced. In conclusion, IL-18 expression in ob/ob mice is differently regulated between adipose tissue and the liver. In contrast to liver, IL-18 protein induction in adipose tissue of ob/ob mice is directly associated with caspase-1 activation, suggesting that caspase-1 might be involved in the regulation of adipose IL-18 production during obesity.

## T1:PS.121

**Abdominal visceral fat reduction is associated with favorable changes of serum retinol binding protein-4 in nondiabetic subjects.**Lee Ji-Won<sup>1</sup>, Lee Hye-Ree<sup>1</sup>, Shim Jae-Yong<sup>1</sup>, Im Jee-Aee<sup>2</sup>, Lee Duk-Chul<sup>1</sup>

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**Context:** The adipocytokine retinol binding protein-4 (RBP4) has recently been shown to link obesity and insulin resistance, although their relationship remains controversial in human studies. The influence of weight reduction with changes of fat distribution on serum RBP4 concentration in nondiabetics is also unknown.

**Objectives:** We assessed the effect of weight reduction (especially abdominal visceral fat loss) on serum RBP4 levels after a structured weight-reduction program.

**Design and Methods:** We conducted a prospective intervention study consisting of a 16-week weight reduction program, including lifestyle modification and adjuvant appetite suppressants. A total of 52 nondiabetic subjects aged  $37.4\pm 11$  years with a body mass index of  $27.4\pm 4$  kg/m<sup>2</sup> were included. Serum RBP4 concentrations with other metabolic parameters and abdominal adipose tissue areas as determined by computed tomography scan were measured both before and 16 weeks after the weight reduction program.

**Results:** Subjects had a 10.9% loss of body weight accompanied by a 25.5% decrease in serum RBP4 levels, with improved insulin sensitivity after the program. The changes in RBP4 levels were significantly correlated with the amounts of abdominal visceral fat loss ( $r=0.38$ ,  $p<0.01$ ) but were not associated with the amount of total body fat loss or abdominal subcutaneous fat loss.

**Conclusion:** Weight reduction, especially the loss of abdominal visceral fat, lowers serum RBP4 concentrations in nondiabetic subjects. The relationship between individual changes in RBP4 and abdominal visceral fat indicated that RBP4 may be involved in the beneficial effect of visceral fat reduction on the improvement of insulin resistance and metabolic syndrome.

**Funding:** This study was supported by a faculty research grant of Yonsei University College of Medicine in 2006.

## T1:PS.122

**Is chronic inflammation a possible cause of obesity-related depression?**

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**Objective:** Adult obesity has been associated with depression, especially in women. It is unclear whether depression leads to obesity or obesity causes depression. Chronic inflammation is observed in obesity and depression. The aim of the study was to assess serum concentrations of TNF- $\alpha$ , TNF soluble receptors, leptin and interleukin – 6 (IL – 6 ) in obese subjects with and without depression.

**Patients and method:** 63 obese women without additional diseases (age  $55.6 \pm 7.5$  y) were included in the study. The Beck's questionnaire was used to assess depression level. After evaluation of depression level study group was divided into subgroups: A – without depression ( $6.1 \pm 3.0$  points) n = 24, B - depression ( $19.6 \pm 5.6$  points) n = 39. Blood samples were taken in the morning after an overnight fast. Serum concentration of TNF- $\alpha$ , sTNFs, leptin and IL-6 were measured by ELISA.

**Results:** There were no differences between age, body mass, BMI and body composition in study subgroups. We did not observe differences of serum concentrations of TNF -  $\alpha$ , sTNFRs, leptin and IL – 6 between subgroups A and B.

	A	B
TNF - $\alpha$ (pg/ml)	$5.9 \pm 2.0$	$6.4 \pm 2.1$
sTNFR1 (pg/ml)	$1369.6 \pm 528.3$	$1631.9 \pm 562.8$
sTNFR2 (pg/ml)	$2179.6 \pm 704.2$	$2301.3 \pm 703.8$
Leptin (ng/ml)	$34.0 \pm 12.1$	$33.8 \pm 17.3$
IL – 6 (pg/ml)	$10.1 \pm 3.4$	$10.1 \pm 3.5$

**Conclusion:** It seems that circulating adipokines did not exert influence on depression level in obese women.

## T1:PS.124

**Obesity abrogates the concentration-dependent biphasic effect of leptin on endogenous cholesterol synthesis in human monocytes**

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**Objective:** Leptin the cytokine-like hormone regulates cholesterol biosynthesis in human monocytes in a concentration dependent manner. Since, monocyte-membrane composition in obesity shows considerable difference from control cells, our aim was to elucidate the concentration dependence of the effect of leptin in monocytes derived from obese patients, and the downstream signaling of high and low leptin concentrations.

**Methods:** Signalling pathways were determined using different inhibitory drugs by measuring IP<sub>3</sub>, [Ca<sup>2+</sup>]<sub>i</sub> and PKC activity in human obese and control monocytes.

**Results:** Our results are as follows: A concentration dependent biphasic effect could only be detected in control monocytes whereas in obese cells only elevated cholesterol synthesis was found. The signal pathway of 50 ng/mL leptin stimulation involves Ca<sup>2+</sup> signal, activation of PI3 kinase, MAP kinase and HMG CoA reductase. In control monocytes the Ca<sup>2+</sup> signal originated from intracellular pools whereas in obese cells from the extracellular environment. In the 500 ng/mL leptin stimulated control monocytes the suppression of cholesterol synthesis was dependent on the Ca<sup>2+</sup> signal, the H-7 sensitive PKC and PI3 kinase activation, whereas in obese monocytes only PI3 kinase was involved in increased cholesterol synthesis.

**Conclusion:** We conclude that leptin signaling in obese monocytes is characterized by Ca<sup>2+</sup> influx, abrogation of H-7 sensitive PKC activation, and by PI3 kinase-mediated PKC activation.

## T1:PS.123

**Serum concentrations of visfatin, resistin, leptin, adiponectin and insulin-resistance**

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**Objective:** The aim of the present study was to determine serum concentrations of visfatin, resistin, leptin and adiponectin in insulin-resistant and insulin-sensitive obese women.

**Material and methods:** 60 obese women on the basis of HOMA index were divided into subgroups: insulin-resistant (n = 26, age  $54.7 \pm 7.8$  y, BMI  $39.3 \pm 6.3$  kg/m<sup>2</sup>) and insulin-sensitive (n = 34, age  $51.4 \pm 10.8$  y, BMI:  $35.0 \pm 4.3$  kg/m<sup>2</sup>). Serum concentrations of visfatin, resistin, leptin and adiponectin were assayed with ELISA kits. Insulin and C-peptide were determined by radioimmunoassay and glucose by colorimetric method. HOMA index was calculated.

**Results:** In all the study group correlation between C-peptide, leptin and body and fat mass, fat percentage and BMI was observed. Visfatin concentrations correlated with fat percentage.

	Insulinresistant	Insulinsensitive
Body mass (kg)	$100.9 \pm 18.0$	$91.8 \pm 12.5$ *
Body fat (kg)	$51.9 \pm 13.6$	$43.4 \pm 9.7$ *
Waist circumference (cm)	$109.0 \pm 13.2$	$104.8 \pm 11.5$
Glucose (mmol/l)	$7.5 \pm 2.7$	$5.1 \pm 0.6$ **
Insulin ( $\mu$ U/l)	$17.1 \pm 5.6$	$6.5 \pm 2.8$ ***
HOMA	$6.1 \pm 3.4$	$1.5 \pm 0.6$ ***
Visfatin (ng/ml)	$35.4 \pm 11.6$	$29.5 \pm 8.6$ *
C-peptide (ng/dl)	$1.1 \pm 0.4$	$0.8 \pm 0.3$ *
Resistin (ng/ml)	$16.5 \pm 8.7$	$13.8 \pm 3.2$
Leptin (ng/ml)	$42.1 \pm 17.8$	$30.8 \pm 13.2$ **
Adiponectin (ng/ml)	$9.7 \pm 3.9$	$10.0 \pm 4.3$

\*p < 0.05; p < 0.001; p < 0.00001

**Conclusion:** We observed higher serum concentrations of visfatin and leptin in insulin-resistance obese women. However, resistin and adiponectin concentrations did not differ between groups.

## T1:PS.125

**Adiponectin Levels and Metabolic Factors in Brazilian Adolescents**

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**Background:** Adiponectin, a novel adipocytokine produced exclusively in the adipose tissue, plays a major role in the development of metabolic syndrome, type 2 diabetes mellitus and related cardiovascular diseases. **Objective:** Our aim was to study the correlations between plasma adiponectin with body mass index; body fat and metabolic factors.

**Methods:** A study comprising 163 adolescents (80 males) with mean age 16.03 y ( $\pm 0.99$ ) enrolled in a public school of São Paulo city. Body mass index, body fat (DXA), blood pressure, lipid profile (TC, HDL-C, LDL-C, triglyceride, Lp(a), apo A<sub>1</sub>, apo B), glucose, insulin, insulin resistance (HOMA-IR) were measured. Data that were not normally distributed were log-transformed. Correlations between adiponectin and all other continuous variables were calculated using Pearson's correlation coefficient. Associations between these variables and adiponectin were evaluated using multiple linear regression.

**Results:** The plasma adiponectin levels were negatively related to BMI (r = -0.431; P<0.001); HOMA-IR (r = -0.375; P<0.001); insulin (r = -0.375; P<0.001); body fat (g) (r = -0.319; P<0.001); triglyceride (r = -0.264; P<0.001); systolic pressure (r = -0.244; P<0.001); apoB (r = -0.188; P=0.015); and positively related to HDL-C (r = 0.383; P<0.001); apoA (r = 0.236; P=0.002). In the multiple linear regression model the adiponectin was independently associated with BMI (P = 0.002); sex (P = 0.018); HDL-C (P = 0.002) and HOMA-IR (P = 0.022).

**Conclusion:** The relationship between adiponectin levels and anthropometric indices and metabolic factors, especially BMI, HOMA-IR and HDL-C was present in this studied population.

## T1:PS.126

**Plasma visfatin levels and expression in peripheral blood cells are increased in obesity and type 2 diabetes mellitus**

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**Introduction:** Visfatin has been proposed as an adipokine with insulin-mimetic and proinflammatory properties. This cytokine, preferentially secreted by visceral adipose tissue, is also expressed by lymphocytes.

**Objective:** The aim of the present study was to measure circulating visfatin concentrations and to examine visfatin expression levels in human peripheral blood mononuclear cells (PBMC), as well as to assess whether its expression is altered in obesity and type 2 diabetes (T2DM).

**Material and Methods:** Plasma concentrations of visfatin were measured in a group of 44 volunteers. In addition, PBMC samples obtained from a subgroup of 27 subjects were used to determine transcript levels of visfatin in PBMC by Real-time PCR. Patients were classified as lean (BMI 20.4±0.5kg/m<sup>2</sup>) or obese (BMI 46.3±1.5 kg/m<sup>2</sup>).

**Results:** Visfatin circulating concentrations and gene expression levels in PBMC of obese patients were significantly ( $P<0.05$ ) increased as compared to lean subjects. No differences were found between normoglycaemic and T2DM obese patients. After adjustment for body fat percentage, a significant positive correlation was found between visfatin plasma concentrations and waist-hip ratio ( $P<0.01$ ), fasting glucose ( $P<0.05$ ) and triglyceride levels ( $P<0.05$ ). Gene expression levels were significantly correlated with body fat percentage ( $P<0.05$ ), fasting glucose ( $P<0.001$ ) and triglyceride concentrations ( $P<0.001$ ). No significant correlation was found between gene expression levels and circulating concentrations of visfatin.

**Conclusion:** We showed an increase of visfatin circulating concentrations and gene expression levels in PBMC of obese patients. The lack of association between the circulating concentrations and the mRNA expression levels in PBMC of visfatin in obesity suggest that PBMC may not be the main source of increased visfatin levels in obesity. This work was supported by FIS PI030381, PI061458 and PI06/90288 from the Spanish Instituto de Salud Carlos III, Ministerio de Sanidad y Consumo and by the Department of Health of the Gobierno de Navarra (48/2003 and 20/2005) of Spain.

## T1:PS.128

**Effect of Exercise Training on A-FABP, lipocalin-2, and RBP4 Levels**

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**Context:** Lipocalin family including adipocyte fatty acid binding protein (A-FABP), lipocalin-2, and retinol binding protein 4 (RBP4) was recently revealed as novel adipokines associated with the metabolic syndrome and type 2 diabetes.

**Objective:** To evaluate the effect of exercise training on lipocalin family along with inflammatory markers in non-diabetic obese Korean women.

**Design:** Prospective study.

**Setting:** This study was conducted at public health center operated by Korean Government.

**Subjects and Methods:** Concentrations of lipocalin family were compared between obese and non-obese women and were evaluated before and 3 months after exercise program including aerobic exercise (45 min/session, 300 Kcal/day) and muscle strength training (20 min/session, 100 Kcal/day) 5 times per week.

**Results:** Obese women exhibited higher A-FABP levels compared to non-obese women (21.4 ± 6.4 ng/ml vs. 13.6 ± 4.4 ng/ml,  $P < 0.001$ ). Both lipocalin-2 and RBP4 levels were not significantly different between them, although significance level was marginal in lipocalin-2 ( $P = 0.054$ ). Circulating A-FABP levels were significantly associated with BMI, waist circumference, triglyceride, ALT, lipocalin-2 and hsCRP levels. After 3 months of exercise training program, serum A-FABP levels were significantly decreased from 21.4 ± 6.4 ng/ml to 19.3 ± 6.8 ng/ml ( $P = 0.038$ ) along with reduction of weight, BMI, and waist circumference, fasting glucose, and total cholesterol levels. However, although IL-6 increased after exercise program, there was no significant change of lipocalin-2 and RBP4 levels.

**Conclusions:** Exercise training with weight loss induced a significant reduction of circulating A-FABP levels in obese Korean women.

## T1:PS.127

**Obestatin concentration is related to makers of oxidative stress, but not global cardiovascular risk**

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**Introduction:** Obestatin, a recently discovered gut hormone, decreases food intake and gastric motility, and may therefore be important in the biology of obesity. Obesity, especially visceral, is strongly associated with macrovascular disease. We have therefore investigated relationships between obestatin and cardiovascular risk factors.

**Methods:** Fasting plasma samples and detailed medical histories were collected from 113 lipid clinic patients. Obestatin was measured by competitive enzyme immunoassay (Bachem Ltd, USA). Paraoxonase activity was determined by an in-house kinetic enzyme assay. CHD and stroke risk were estimated using the HEART-UK global risk calculator. eGFR was calculated using the 4-variable MDRD equation.

**Results:** Obestatin positively correlated to age ( $r=0.244$ ,  $p=0.009$ ,  $n=113$ ), paraoxonase activity ( $r=-0.282$ ,  $p=0.004$ ,  $n=101$ ) and aspirin usage (1.09ng/mL in users ( $n=59$ ) versus 0.78ng/mL in non-users ( $n=19$ ),  $p=0.007$ ). Obestatin negatively correlated to triglyceride concentration ( $r=-0.258$ ,  $p=0.007$ ,  $n=108$ ), weekly alcohol consumption ( $r=-0.274$ ,  $p=0.045$ ,  $n=54$ ) and smoking status (0.74ng/mL in smokers ( $n=19$ ) versus 1.16ng/mL in non-smokers ( $n=92$ ),  $p=0.001$ ).

A trend was observed in ex-smokers between obestatin and the time since smoking cessation ( $r=0.280$ ,  $p=0.088$ ,  $n=38$ ). No statistically significant relationships were observed between obestatin and sex, BMI, cholesterol concentration, blood pressure, eGFR, statin usage or global CHD or stroke risk.

**Discussion:** Obestatin and paraoxonase, an enzyme inhibited by oxidative stress, were positively correlated. While obestatin concentration was not related to global CVD risk, it is possible that obestatin degradation may be increased in situations of high oxidative stress, such as smoking, excessive alcohol consumption or hypertriglyceridemia, while the anti-oxidant effect of aspirin may decrease obestatin degradation.

## T1:PS.129

**Adiposity reduction by cla is associated with a decrease in circulating adiponectin and leptin levels in mice**

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The **Aim** of this study was to characterise the effects of conjugated linoleic acid (CLA) on adipose depots and adipokine levels in control and obese mice.

**Methods:** Mice received daily gavages of: 0.15 or 0.5 g CLA / Kg body weight (CLA1 or CLA2 group).

**Experiment 1:** Mice fed a standard (8.7%kcal%fat) or a cafeteria diet for 45 days. Since then, they received CLA1 or sunflower oil (control) for 9 days.

**Experiment 2:** Mice fed a normal-fat diet (10%kcal%fat) and treated with CLA1, CLA2 or sunflower oil for 37 days.

**Experiment 3:** Mice fed with a high-fat diet (45%kcal%fat) and treated with CLA1, CLA2 or sunflower oil for 30 days. Since then, they received a double dose for 35 days.

**Results:** 9-day-CLA treatment did not cause any apparent effect on body and tissue weights or adiponectin and leptin levels in lean or obese animals. In experiments 2 and 3 adiposity, adiponectin and leptin levels were not affected by CLA1 treatment. CLA2 treatment reduced adiposity, although did not attain significantly differences in body weight gain. CLA2 groups showed plasma leptin (22%) and adiponectin (27%) reductions in animals fed on normal-fat diet. Higher reductions were found in animals fed on high-fat diet (34% and 78 %, respectively).

**Conclusions:** CLA treatment reduces adiposity more than body weight gain. The fact that adiponectin and leptin circulating levels reflects the effect of CLA on adiposity when no changes were observed on body weight gain reveals their potential role as early biomarkers of CLA effects.

## T1:PS.130

**The effect of weight reduction on serum concentrations of ghrelin and insulin – like growth factor – I in obese women**

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**Objective:** The aim of the present study was to examine how weight loss treatment modulates serum concentrations of ghrelin and insulin – like growth factor - I (IGF-I) in obese women and to determine whether there is association between possible changes in serum concentrations of these hormones after weight loss.

**Material and Methods:** The study group involved 22 obese women without additional disease (age 40.6 ± 12.9 years; BMI 37.2 ± 4.6 kg/m<sup>2</sup>). All subjects participated in a 3-month weight reduction program. The measurements were performed at the baseline and after weight loss. Serum concentration of ghrelin and IGF-I were measured by (ELISA) kit. Serum concentrations of insulin was measured by RIA.

**Results:** The mean weight loss was 9.3 ± 4.1 kg (9.7 ± 4.3%). We observed significant positive correlation between increase of ghrelin and decrease of body fat % after weight loss (r=0.44, p=0.03). There are no correlations between change of ghrelin and IGF – I concentrations and between changes of insulin and IGF – I concentrations.

	Baseline	After weight loss	p
Ghrelin ( pg/ml )	63.5 ± 13.0	72.8 ± 15.1	0.01
IGF – I ( ng/ml )	126.9 ± 67.0	170.5 ± 83.3	0.01
Insulin ( μIU/ml )	17.7 ± 8.5	14.8 ± 10.4	0.05

**Conclusion:** Serum concentrations of ghrelin and IGF-I increased after weight loss. However, it seems there is no association between serum concentrations of ghrelin and IGF-I in obese women.

## T1:PS.132

**Low sex hormone-binding globulin in obese women with PCOS**

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The aim of the study was to compare the body fat distribution of women with polycystic ovary syndrome (PCOS) with age and body mass index matched healthy controls and to investigate if androgens and insulin resistance associated with fat distribution. Thirty- PCOS women were evaluated in terms of body mass index (BMI). Blood samples were obtained for follicle stimulating hormone (FSH), luteinizing hormone (LH), estradiol, prolactin, thyroid stimulating hormone (TSH), dehydroepiandrosterone-sulfate (DHEA-S), total testosterone, sex hormone binding globulin (SHBG). Insulin and glucose levels. Insulin resistance was estimated by HOMA IR

BMI were significantly higher in patients with PCOS (p < 0.05). Total testosterone was found to be positively correlated with fat BMI (r = 0.401, p < 0.05). There was still significant correlation between total testosterone and SHBG after controlling for age and BMI. Low sex hormone-binding globulin was found in obese women with PCOS.

**Conclusion:** Total testosterone and SHBG levels are positively correlated with the BMI in women with PCOS.

## T1:PS.131

**Leptin, insulin resistance and body composition in men**

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Some clinical investigations have detected relations between leptin and body composition, and variations of serum leptin with age, pointing to leptin resistance being associated with age.

**Objectives:** Contribution to the study of the relationship of plasmatic leptin levels and the HOMA in males.

**Material and methods:** In 52 men (60,1± 11,1 years of age), fasting blood samples were collected to measure glycaemia, insulinaemia and of plasma leptin. BMI (kg/m<sup>2</sup>) and HOMA were calculated. The sample was divided according to BMI in the normoponderal, the overweight and the obese groups. The total body composition was assessed by radiologic densitometry using QDR Discovery W densitometer (Hologic, Inc.). The data were submitted to descriptive analysis, One Way and Multifactorial ANOVA tests, and adjusted for chronological age and, or BMI and, or total fat mass.

**Results:** Mean serum leptin levels were higher in the obese group (P <0.05). The mean HOMA were identical between groups of BMI. A positive relationship was detected between the plasma leptin levels and HOMA (P = 0.001). The plasma leptin concentration was positively related with the total body fat mass and the fat mass percentage (P = 0.0000), but no relationship was detected with the total lean mass.

**Conclusions:** The results of this study, suggest that the concentration of serum leptin is associated with the quantities and the fat mass percentage in men. The relationship between HOMA and leptin plasma levels seems to indicate an association of the leptin with insulin resistance in men.

## T1:PS.133

**Influence of partial sleep deprivation on energy balance and insulin sensitivity in healthy women**

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**Background:** Voluntary sleep restriction is a lifestyle feature of modern societies that may contribute to obesity and diabetes.

**Objective:** The aim of the study was to investigate the impact of partial sleep deprivation on insulin sensitivity and the regulation of energy balance.

**Methods:** In a controlled intervention, 14 healthy women (age 23-38 years, BMI 20.0-36.6kg/m<sup>2</sup>) were investigated after 2 nights of >8h sleep/night (T0), after 4 nights of consecutively increasing sleep curtailment (7h, 6h, 6h and 4h sleep/night, T1) and after 2 nights of sleep recovery (>8h sleep/night, T2). Resting and total energy expenditure (REE, TEE), glucose induced thermogenesis (GIT), physical activity, energy intake, glucose tolerance and endocrine parameters were assessed.

**Results:** When compared with T0, energy intake (+20%), body weight (+0.4kg), leptin secretion (+29%), free triiodothyronine (+19%), free thyroxine (+10%) and GIT (+34%) significantly increased with sleep deprivation (all P<0.05). Mean REE, physical activity, TEE, oral glucose tolerance and basal ghrelin levels remained unchanged, but the decrease in plasma ghrelin levels following an oral glucose load was reduced at T1. The effect of sleep loss on GIT, fT3, fT4 and cortisol levels was inversely related to fat mass. Sleep loss-induced variances in REE and insulin sensitivity were associated, an increase in REE was related to a decrease in insulin sensitivity (r=-0.73, P<0.01).

**Conclusions:** Short-term sleep deprivation affects both sides of energy balance and leads to net weight gain. Sleep loss induced variances in energy expenditure were associated with fat mass and insulin sensitivity.

## T1:PS.134

**Plasma interleukin-6 concentration increases in parallel to increased fuel utilization during cold exposure**Dickson, C.<sup>1,2</sup>, Haman, F.<sup>1,2</sup>, Blondin, D.<sup>1,2</sup>, Dépaule, I.<sup>1,2</sup>, Imbeault, P.<sup>1,2</sup><sup>1</sup>Behaviour and Metabolic Research Unit, University of Ottawa, Ottawa, Canada<sup>2</sup>Department of Human Kinetics, University of Ottawa, Ottawa, Canada

Recent work suggests that interleukin-6 (IL-6) is released during muscle contractions, promoting skeletal muscle lipid oxidation and glucose uptake. In cold-exposed adult humans, involuntary muscle contractions during shivering are mainly sustained through the oxidation of carbohydrates and lipids. The goals of this study were 1) to examine the effects of cold exposure on changes in plasma IL-6 levels; 2) to determine whether these changes are accompanied by these in substrate metabolism during cold exposure. On two different occasions, 6 men (age 24±5y; % body fat 12±3) were exposed to cold (liquid conditioned suit perfused with 4°C water). During each session, subjects ingested either LOW concentration (0.04g/min) or HIGH concentration (0.8g/min) glucose solution. Using indirect calorimetry and isotope tracer methodology, substrate metabolism was quantified. Plasma IL-6 was assayed from blood drawn at room temperature and every 30 minutes during 2 hours of cold exposure. During cold exposure, plasma IL-6 levels increased significantly over time (1.00 ±0.19 pg/ml to 1.80 ±0.42 pg/ml, p<0.05) regardless of the condition. Lipid oxidation (60 ±12 mg/min to 204 ±26 mg/min, LOW and 55 ±4 mg/min to 155 ±28 mg/min, HIGH; p<0.05) and plasma glucose utilization (50 ±5 mg/min to 192 ±15 mg/min, LOW and 40 ±5 mg/min to 256 ±22 mg/min, HIGH; p<0.05) increased in both conditions but to a greater extent in HIGH. In conclusion: 1-) plasma IL-6 concentrations increase during cold exposure and 2-) these changes are associated with increases in glucose and lipid utilization.

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## T1:PS.136

**Functional Analysis of UCP3 Natural Mutants in Severely Obese Children from Southern Italy**Musa, C.V.<sup>1</sup>, Alfieri, A.<sup>2</sup>, Labruna, G.<sup>1</sup>, Valerio, G.<sup>3</sup>, Franzese, A.<sup>4</sup>, Pasanisi, F.<sup>5</sup>, Sacchetti, L.<sup>1</sup> and Buono, P.<sup>1,2,3</sup>

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Uncoupling proteins (UCPs) are mitochondrial carrier proteins that increase energy expenditure thus decreasing body weight. Recent evidences suggested that UCP3, the muscle-specific isoform, is involved in lipid metabolism promoting fatty acids  $\beta$ -oxidation and reducing their storage. We identified four novel mutations in severely obese (BMI-SDS>2,5) children with early obesity onset (<4y) from Southern Italy: three missense mutations V56M, A111V, V192I, and one non-sense, Q252X, that generates a truncated protein. Here we report preliminary results of *in vitro* functional analysis of *wild-type* (*wt*) and V192I and Q252X mutant proteins. We cloned human UCP3 cDNA *wt* in the expression vector p3xFLAG-CMV-7.1; mutants were obtained by site-directed mutagenesis. Constructs were transiently transfected in HEK 293 cells, lacking of endogenous UCP3. Mitochondrial localization of *wt* and mutant proteins was assayed by western blotting. Activity of mutant proteins *vs wt* was indirectly measured incubating cells with 100  $\mu$ M palmitic acid mix containing 16,7  $\mu$ Ci/ml of <sup>3</sup>H-labeled palmitic acid for 2 hours with and without  $\beta$ -oxidation inhibitors; <sup>3</sup>H-labeled water, produced by palmitate oxidation, was collected and measured at the end (1). All transfected proteins were correctly localised in mitochondria. V192I generated similar amount (97%) of <sup>3</sup>H-labeled water to respect to *wt* protein; conversely, Q252X mutant, generated only a low amount (20%) of <sup>3</sup>H-labeled water. Interestingly, children carrying Q252X mutation showed highest QR value (1,05) to respect to the mean QR value from obese children without UCP3 mutations (0,85), thus suggesting impaired fatty acids oxidation. Reference

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## T1:PS.135

**Role of the melanocortin 3 receptor mutations in childhood obesity**Dubern, B.<sup>1,2</sup>, Benajiba, L.<sup>1</sup>, Alili, R.<sup>1</sup>, Simon, C.<sup>3</sup>, Galan, P.<sup>4</sup>, Costes, B.<sup>5</sup>, Tounian, P.<sup>1,2</sup>, Clément, K.<sup>1</sup><sup>1</sup>Inserm Nutrimique U872(Eq7), Paris 6 University, Hôtel-Dieu, Paris, France<sup>2</sup>Pediatric Gastroenterology and Nutrition, Armand-Trousseau hospital, AP-HP, Paris, France<sup>3</sup>Strasbourg University, EA 1801, Strasbourg, France<sup>4</sup>UMR U557 INSERM; U 11125 INRA; Cnam; P13 University, CRNH, IdF, Bobigny, France<sup>5</sup>Biochemistry and genetics, Henri Mondor Hospital, APHP, INSERM U841, Créteil, France

The melanocortin 3 receptor (MC3R) plays a key-role in the control of energy homeostasis. Few studies evaluated the frequency of MC3R mutations in large populations of obese and control subjects and their impact on obese phenotype.

**The aim of our study** was to determine the frequency and role of MC3R mutations in early-onset obesity.

**Methods:** Direct sequencing of the coding region of MC3R gene was performed in 444 obese children (age 13.4±3.3y, BMI Z-score 4.3±1.1SD), 337 control children (age 11.5±0.6y, BMI Z-score 0.1±1.0 SD) and 416 control adults (age 49.0±6.6y, BMI 22.1±1.8 kg/m<sup>2</sup>). Phenotype in obese children included obesity history, body composition, resting metabolic rate, fasting lipids, insulinemia and glucose.

**Results:** 6 heterozygous mutations (2.03%) were detected in 9 unrelated obese subjects (S17T, V177I, T280S, I335S) including one silent mutation (I226I) and one mutation in non coding region (T-4C). The frequency of MC3R mutations in controls was not significantly different (1.13% in control children and 1.68% in adults). Phenotype of obese children with MC3R mutation was not significantly different when compared to children without mutation except for height which was higher in mutation carriers. Segregation analysis in families revealed an autosomic transmission with variable expression.

**Conclusions:** 1) MC3R mutations are frequent in obese children but are also found in control populations; 2) No specific phenotype was detected in MC3R mutation carriers except for height; 3) The roles of MC3R mutations in obesity need to be clarified in larger populations and their *in vitro* functional consequences are to be identified.

## T1:PS.137

**Clinically achievable weight loss improves symptoms of androgen deficiency but does not increase Androgen Bioactivity or Testosterone concentrations in Obese men**Ong CR.<sup>1,2</sup>, Lai J.<sup>3</sup>, Lloyd TB.<sup>4</sup>, Ipavec-Levasseur, S.<sup>6</sup>, Liu PY.<sup>5</sup>, O'Moore Sullivan TM.<sup>1,2</sup>, Prins JB.<sup>1,2,3</sup><sup>1</sup>Diamantina Institute, University of Queensland, Brisbane, Australia<sup>2</sup>Department of Diabetes and Endocrinology, Princess Alexandra Hospital, Brisbane, Australia<sup>3</sup>Institute of Health and Biomedical Innovation, Queensland University of Technology, Brisbane, Australia<sup>4</sup>Department of Radiology, Princess Alexandra Hospital, Brisbane, Australia<sup>5</sup>ANZAC Research Institute, University of Sydney, Sydney, NSW, Australia<sup>6</sup>Diamantina Institute, University of Queensland, Brisbane, Australia

Androgen deficiency (AD) alters body composition and contributes to increased adiposity. Determining the androgen status of obese men is limited by suboptimal clinical and biochemical measures of androgen activity. To test the hypothesis that obese men are androgen deficient and weight loss improves androgenicity, we conducted an 18 month lifestyle intervention in 20 healthy obese men. Morning blood samples were analysed for total testosterone, sex hormone binding globulin, albumin and gonadotrophins. A now gold standard HPLC-Tandem Mass Spectrometry method was used for measuring testosterone concentration. An in-house androgen receptor-driven Dual-Luciferase Reporter Bioassay was used to measure androgen bioactivity. At baseline, both total and calculated free testosterone correlated negatively with body fat measured by DEXA ( $r=-0.592$  and  $-0.537$ ,  $p<0.05$ ) and positively with fitness using indirect calorimetry during a graded exercise test ( $r=0.492$ ,  $p<0.05$ ). There was no correlation with clinical measures including symptoms of AD, hand grip strength and testicular volume. After lifestyle intervention, participants lost 7.4±5.2 % (9.0±6.3kg) of body weight ( $p<0.001$ ). There was no significant change in testosterone or androgen bioactivity. This may be related to a significant increase in SHBG (3.3±4.4nmol/L) offset by a similar decrease in albumin (6.7±8.4g/L) ( $p<0.005$ ). We conclude that clinically achievable weight loss in obese men does not alter androgenicity as assessed by comprehensive biochemical and clinical measurements. Despite this, clinical symptoms of AD and hand grip strength improved significantly ( $P<0.05$ ), possibly due to improved overall well being and fitness. These data suggest that adiposity does not directly alter the gonadal axis or androgen action.

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## T1:PS.138

**Androgen Replete Obese Men are More Insulin Sensitive, Store Less Intramyocellular Lipids and have less Intramyocellular Lipids for Use in Acute Exercise.**Ong CR<sup>1,2</sup>, Ipavec-Levasseur S<sup>1</sup>, Cowin G<sup>3</sup>, Liu PY<sup>4</sup>, O'Moore Sullivan TM<sup>1,2</sup>, Prins JB<sup>2,3</sup><sup>1</sup>Diamantina Institute, University of Queensland, Brisbane, Australia<sup>2</sup>Department of Diabetes and Endocrinology, Princess Alexandra Hospital, Brisbane, Australia<sup>3</sup>Centre for Magnetic Resonance, University of Queensland, Brisbane, Australia<sup>4</sup>ANZAC Research Institute, University of Sydney, Sydney, NSW, Australia

In athletes and lean healthy men, intramyocellular lipids (IMCL) are an intracellular source of energy during exercise. IMCL content is increased in trained as well as obese individuals, and is associated with insulin resistance. Androgen deficiency (AD) reduces strength and endurance. Whether the biochemical partial AD of obesity alters the storage or utilisation of IMCL in acute exercise, thereby contributing to reduced endurance, is unknown. To test this hypothesis, we conducted a cross sectional study on 18 healthy community dwelling obese men with a mean weight of 120.9±17.4kg and examined the relationship between blood testosterone levels with IMCL storage and utilisation. IMCL was measured before and after an hour-long session of exercise by Magnetic Resonance Spectroscopy. Early morning blood samples were analysed for total testosterone (by gold standard Isotope Dilution Liquid Chromatography - Tandem Mass Spectrometry), sex hormone binding globulin, albumin and gonadotrophins (by immunoassay). Total testosterone was inversely correlated with percentage of body fat (DEXA) and insulin sensitivity (HOMA) ( $r=-0.59$  and  $-0.48$ , respectively) but positively with fitness independent of fat free mass ( $r=0.49$ ) (each  $p<0.05$ ). Calculated free testosterone correlated negatively with IMCL stores ( $r=-0.57$ ) whereas total and free testosterone both predicted a reduced ability to mobilise IMCL during acute exercises ( $r=-0.53$  and  $-0.61$ ) (each  $p<0.05$ ). We propose that androgen replete obese men are more insulin sensitive, store less IMCL and therefore have less IMCL stores to be utilised during acute exercise than those who are androgen deficient.

**Funding:** This study was funded by a National Health and Medical Research (NHMRC) Health Research Partnership Grant

## T1:PS.140

**Whole genome expression profiling of subcutaneous adipose tissue of lean and overweight men reveals a differential functionally relevant response to short-term dietary intervention**van Erk, MJ<sup>1</sup>, Pasma, WJ<sup>1</sup>, Wortelboer, HM<sup>1</sup>, van Ommen, B<sup>1</sup>, Hendriks, HFJ<sup>1</sup><sup>1</sup> TNO Quality of Life, Zeist, the Netherlands

Adipose tissue has important metabolic and endocrine functions. Obesity is associated with changes in these functions and with an increased inflammatory state, often leading to a range of complications.

The goal of this study was to investigate the effect of a short-term nutritional intervention on gene expression in adipose tissue from lean and overweight subjects. Therefore, gene expression profiles were measured in abdominal, subcutaneous adipose tissue biopsies from 9 lean and 8 overweight men after consumption of a PUFA-enriched spread or a control spread (40 gram of fat daily) for 9 days.

Subcutaneous adipose tissue gene expression profiles of lean and overweight subjects were distinctly different, mainly with respect to genes involved in defense response and genes involved in metabolism. Adipose tissue from lean subjects showed a more pronounced and consistent response to the dietary intervention than adipose tissue from overweight subjects. In lean subjects, consumption of PUFA-enriched spread resulted in changes in expression of genes related to energy metabolism. In the majority of overweight subjects, down-regulation of expression of inflammatory genes and up-regulation of expression of lipid metabolism genes might reflect a beneficial effect of the intervention. Individual response to the intervention in overweight subjects was highly variable and correlated to obesity phenotype markers waist-hip ratio and waist circumference, suggesting a link between body fat distribution and response to nutritional intervention.

This study indicates that whole genome expression profiling in adipose tissue may help to identify relevant targets of nutritional intervention in obesity prevention or treatment.

**Funding:** This study was financially supported by Dutch government through grant "Healthy nutrition" (grant number 04003)

## T1:PS.139

**Protein induced sparing of Fat Free Mass in energy balance**Soenen, S<sup>1</sup>, Westertep-Plantenga, MS<sup>1</sup><sup>1</sup>Department of Human Biology, Top Institute Food and Nutrition (TIFN), Nutrition and Toxicology Research Institute Maastricht (NUTRIM), Maastricht University, Maastricht, The Netherlands

**Background:** Protein-rich diets spare fat free mass (FFM) during energy restriction and weight loss and gain FFM at the cost of fat mass (FM) during weight-maintenance thereafter.

**Objective:** To examine if there is a FFM-sparing effect with a high protein diet without the trigger of intervention, thus in energy balance.

**Design:** The 4-compartment body-composition; FM, bone mass content (BMC), water and protein mass of 25 subjects (BMI 22.07±1.71kg/m<sup>2</sup>) and blood parameters were assessed before and after a 3-months dietary-intervention of 2MJ supplements of protein, or carbohydrate or fat, as exchange with 2MJ of habitual energy intake, thus creating a range in protein intake of 96-203% of individual's protein needs. Protein intake was calculated based on 24-hour nitrogen.

**Results:** On average, subjects were in energy balance and did not change their physical activity over time. Change in body weight ( $\Delta BW$ ) ranged between -1.23kg and +1.93kg. FFM increased significantly by 0.73kg ( $P=0.033$ ), independently of  $\Delta BW$ . Independently of  $\Delta BW$ , protein intake explained 24% of variation in  $\Delta\%FFM$  ( $P=0.047$ ), while habitual leisure-time physical activity explained 45% ( $P=0.009$ ). Protein intake explained 29% of variation in  $\Delta BMC$  ( $P=0.030$ ). FM decreased by 0.34kg. Trunk %FM was negatively related to protein intake ( $r=-0.598$ ,  $P=0.014$ ). Fasting FFA concentrations were positively related to FM and negatively to FFM ( $r=0.656$  and  $r=-0.556$ ,  $P=0.013$ ).  $\Delta HDL$  concentration was a function of protein intake ( $r=0.647$ ,  $P=0.009$ ).

**Conclusion:** A 50% elevation in protein intake of individual's protein needs increased FFM independently of  $\Delta BW$ , with additional positive effects on lipid and bone characteristics.

**Funding:** Research related to this abstract was funded by Top Institute Food and Nutrition (Wageningen, The Netherlands).

## T1:PS.141

**Exercise training, but not weight loss, increases muscular work efficiency and enhances fat oxidation.**

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**Purpose:** Perturbations in body weight have been shown to affect energy expenditure and efficiency during exercise. The separate effects of weight loss and exercise training on muscular efficiency or the proportion of energy derived from fat oxidation during physical activity, however, are not known. The purpose of this study was to determine the effects of exercise training with and without concomitant weight loss on metabolic efficiency and fat oxidation during steady state submaximal exercise in older obese subjects.

**Methods:** 64 sedentary older (67±0.5) obese (30.7±0.4kg/m<sup>2</sup>) volunteers participated in a 3-arm clinical trial consisting of 4 months of either diet induced weight loss (WL, n=11), exercise training (EX, n=37) or the combination of both interventions (WLEX, n=16). Before and after intervention, energy expenditure (EE), gross efficiency (GE), economy (EC) and proportion of energy expended from fat (EF) were determined during a one hour submaximal (50% of  $VO_{2max}$ ) cycle ergometry exercise.  $VO_{2max}$  was determined by GXT and fat free mass (FFM) was determined by DXA.

**Results:** The table below shows that EX, but not WL alone, increased GE and EC. The addition of concomitant WL to EX (WLEX), however, may have an additive effect on muscular efficiency during moderate physical activity. These effects remained after adjusting for changes in FFM. The proportion of energy derived from fat increased with EX.

**Conclusion:** Exercise training, but not weight loss alone, increases metabolic efficiency and promotes greater utilization of fat during moderate physical activity in previously sedentary, obese adults.

Percent change	WL	EX	WLEX
Weight	-9.2 ± 0.9* <sup>A</sup>	-1.4 ± 0.5* <sup>B</sup>	-8.5 ± 8** <sup>A</sup>
FFM	-4.3 ± 0.8* <sup>B</sup>	0.1 ± 0.5 <sup>A</sup>	-1.5 ± 0.7* <sup>A</sup>
$VO_{2max}$	0.4 ± 4	10.4 ± 2.1*	4.3 ± 3.3*
EE	-2.6 ± 3.5*	-2.8 ± 2*	-7.1 ± 2.8*
GE	3.8 ± 2.7	4.8 ± 2.1*	8.1 ± 3.0*
EC	3.3 ± 3.9	4.7 ± 2.2*	9 ± 3.2*
EF	16.7 ± 27.3	23.4 ± 15.1*	38 ± 22

Mean ± SEM; Within-group changes from paired t test (\* $p<0.05$ , <sup>A</sup>marginal  $P=0.06-0.07$ ), Between group differences with 1-way Anova (<sup>A</sup>different than<sup>B</sup>)

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## T1:PS.142

**Serotonin 2C receptor (5HT2CR) signaling contributes to the feeding-inhibitory effects of cholecystokinin (CCK) and glucagon-like peptide-1 (GLP-1), but not leptin, in mice.**

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Central 5HT contributes to the control of food intake, in part by acting at 1BR and 2CR sites the hypothalamic arcuate (Arc) nucleus, a key site for the reception and integration of peripheral endocrine signals. Still unclear, however, is which feeding-control signals 5HT modulates and how this occurs in the brain. To investigate the role of 5HT2CR in the satiating action of gut peptides, we examined (1) the effect of null mutations (KO) of 5HT2CR on the feeding inhibitory potencies of CCK (1, 2, or 4 µg/kg, IP) and GLP-1 (100, 200 and 400 nmol/kg, IP) and (2) the distribution of CCK-induced c-Fos immunoreactivity (cFIR) in the brain. The feeding-inhibitory effect of leptin (1 mg/kg, SC) was tested as a positive control (Nonogaki et al., 1998). Peptides were injected at dark onset. Food intake was measured every 30 min for 4 h. cFIR was measured 90 min after dark onset in separate mice without food access. All CCK and GLP-1 doses decreased food intake in WT, but not KO mice. Leptin decreased food intake similarly in WT and KO mice. CCK (2 µg/kg, IP) induced cFIR similarly in the PVN and Arc of WT and KO mice, but there was significantly more cFIR in the NTS of WT vs. KO mice. These results suggest that 5HT-5HT2CR signaling is necessary for the full satiating effects of CCK and GLP-1 and that for CCK satiation, the NTS is one site where integration with 5HT-5HT2CR signaling occurs.

## T1:PS.144

**Physical activity, energy expenditure and a FTO gene variant in relation to obesity**Berentzen, T<sup>1</sup>, Kring, SII<sup>1,2</sup>, Holst, C<sup>1</sup>, Zimmerman, E<sup>1</sup>, Jess, T<sup>1</sup>, Toubro, S<sup>1</sup>, Hansen, T<sup>1</sup>, Astrup, A<sup>3</sup>, Pedersen O<sup>4</sup>, Sørensen, TIA<sup>1</sup>

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**Objective:** The A-allele of a *FTO* (rs9939609) associates with obesity in Caucasians, but the function and pathway of *FTO* is unknown. We hypothesize that the *FTO* operates through an influence on energy expenditure (EE), and investigated whether the rs9939609 of *FTO* and physical activity (PA) and/or EE were associated, and whether an association between the *FTO* variant and obesity was dependent on PA and/or EE.

**Methods:** The study population included all obese young men at the draft board examinations in Copenhagen and its surroundings in 1943-77, and a randomly selected group from the same population. Information on fat mass (FM), lean body mass (LBM), PA, maximum oxygen uptake (VO<sub>2</sub>max) and EE were collected in 1991-93 and 1998-00 (median ages 42y and 48y). Genotyping was carried out in 753 obese and 879 controls. A recessive transmission mode fitted the data best (TT/TA versus AA). Logistic regression was used to assess the odds ratios of the genotype in relation to: PA, EE, and interactions between FM\*PA and FM\*EE.

**Results:** The A-allele of the *FTO* variant was strongly linearly associated with FM, but not significantly associated with leisure time PA, VO<sub>2</sub>max, resting EE or glucose-induced EE. No interactions between FM and the PA measures or EE measures were found. Adjustment for age, FM and LBM had no influence on the results.

**Conclusions:** The examined variant in *FTO* is not associated with PA or EE, but associated with FM irrespective of the level of PA and EE in our cohort of Caucasian men.

## T1:PS.143

**The effects of omitting breakfast on metabolic responses to a standard liquid preload.**

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Habitually omitting breakfast adversely affects metabolic parameters [1].

The aim of this study was to investigate the metabolic responses to a standard preload when consumed after a standardized breakfast or extended fast.

Twelve normal weight (BMI 23.5 (± SD 1.7) kg.m<sup>2</sup>), non-smoking males (mean age 24.3 (± SD 7.3) years) took part in a randomised cross over trial. Subjects were assigned to receive breakfast (Rice Krispies and semi skimmed milk equivalent to 10% individual daily energy requirement) at approx 08.00 (NB) or miss breakfast (OB) in a random order after an overnight fast. A standard 250kcal preload (21, 39 and 41 % total energy from protein, carbohydrate and fat respectively and contained 1500mg acetaminophen as a marker of gastric emptying) was consumed at approx 11.00. Arterialized venous blood samples were collected at baseline (fasting), prior to consuming the preload, and at 15 minute intervals for 90 minutes following preload consumption.

Plasma glucose and insulin response (iAUC) to the preload were significantly greater in OB trial (P<0.05). FFA were significantly different between trials (P <0.05). There were no significant differences in serum acetaminophen concentrations between trials, but rate of increase of showed a trend to be greater in B trial (P<0.1). Plasma ghrelin responses were not different between trials.

The metabolic responses to a standard liquid preload are different when the preload is provided after a breakfast compared with following an extended fast. This aspect of study design should be considered carefully when interpreting results from appetite studies using preloads.

1. Farshchi, H.R., M.A. Taylor, and I.A. Macdonald, *Deleterious effects of omitting breakfast on insulin sensitivity and fasting lipid profiles in healthy lean women*. Am J Clin Nutr, 2005. **81**(2): p. 388-96.

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## T1:PS.145

**Cyclin-dependent kinase inhibitors-related genes are regulated by cafeteria diet and vitamin c supplementation in rats**Boqué, N<sup>1</sup>, Campión, J<sup>1</sup>, Milagro, FI<sup>1</sup>, Martínez JA<sup>1</sup>

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**Introduction:** The aim of this research was to study cyclin-dependent kinase inhibitors (CKIs) mRNA expression in white adipose tissue (WAT) and liver from high-fat diet fed rats with or without vitamin C (VC) supplementation, in order to analyze the potential relationships between diet-induced obesity and genes involved in cell-cycle progression.

**Methods:** Three groups of male Wistar rats (n=25) were fed on a standard pelleted (Control group) or a high-fat diet during 56 days in the absence (Cafeteria group) or receiving an oral supplementation (750 mg/kg of body weight) of VC (VC group). At the end of the experimental period, body composition and gene expression of p21, p27, p57, skp2 and p53 were analyzed.

**Results:** Animals fed on a high-fat diet increased significantly their body weights and total body fat. Interestingly, VC supplementation partially prevented this diet induced-adiposity. RT-PCR studies show that cafeteria diet decreased p21, p27 and p57 mRNA expression in subcutaneous WAT without any relevant change in retroperitoneal WAT and liver. Furthermore, VC supplementation decreased p53 and Skp2 gene expression in subcutaneous WAT and increased liver p21, p27 and Skp2 mRNA in comparison to control and cafeteria-fed groups.

**Conclusion:** These results demonstrate a relationship between several genes implicated in cell cycle progression and diet-induced obesity, especially in the subcutaneous WAT depot, suggesting a key-role of CKIs genes in the control of adipogenesis. Moreover, hepatic mRNA changes induced by VC indicate a possible role of these genes in diet-induced oxidative stress processes.

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## T1:PS.146

**Multidisciplinary therapy improves body composition, ghrelin, food intake and eating disorders in obese adolescents**

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**Background/ Aims:** Peripheral hormones like ghrelin, that influence food intake, may play a role in eating disorders development. The goal of this study was to evaluate the multidisciplinary intervention on ghrelin concentration and macronutrients intake in obese adolescents with eating disorders symptoms.

**Methods:** Fourth-three post-puberty obese adolescents with eating disorders symptoms were submitted to short-term multidisciplinary therapy (nutrition, psychology, exercise and clinical support) during 6 months, including 16 boys (BMI 36.30 ± 4.65 wt/ht<sup>2</sup>) and 27 girls (BMI 35.88 ± 4.65 wt/ht<sup>2</sup>). Food intake was assessed by 3 days recordatory inquiry, body composition was measured by Plethismography and plasma ghrelin concentrations were measured by a radioimmunoassay (RIA). Bulimic and binge eating behavior were measured by Bulimic Investigation Test Edinburgh (BITE) and Binge Eating Scale (BES) respectively.

**Results:** The short-term multidisciplinary therapy was effect to reduce significantly body mass, BMI, fat mass, energy intake and fat intake associated with a reduction in 51% of eating disorders symptoms in obese adolescents. Indeed, ghrelin concentration presented increased and carbohydrate intake presented reduced in girls after therapy.

**Conclusion:** These results suggest ponderal weight loss and long-term therapy to treat eating disorders symptoms and to control ghrelin concentration avoiding the recidivism effects observed after weight loss.

**Keywords:** Macronutrient, Obesity, Adolescents, Ghrelin, Eating disorder.

## T1:PS.148

**Influence of fat mass changes on the regulation of energy expenditure**

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Whether adaptation of resting energy expenditure (REE) to calorie restriction exists is debated. The aim of this work was to study REE adjusted for fat free mass 6 months after a gastric bypass.

48 obese patients (40±10 yrs, BMI 47±7.2 kg/m<sup>2</sup>) had REE (indirect calorimetry), fat and fat-free mass (FM, FFM, 3 compartment model with BIA, body density and weight) measured before and 6 months after a 32±10 kg weight loss obtained by gastric bypass. The difference (RES) between the measured REE at 6 months (REEm6) and the theoretical REE (REEt6, calculated with the regression equation between REE and FFM at month 0) were computed. Patients were separated in tertiles of RES values, the lower RES the greater the adaptation process. Tertiles had similar physical characteristics at M0. Mean RES were -378±148, -172±41, and 15±72 kcal/d in the 3 tertiles. Weight and FFM changes at 6 months were similar between tertiles. Fat mass changes were greater in the tertile with the greater adaptation (P=0.07). The intensity of the energy deficit (calculated from the body composition changes and energy requirement at month0) was negatively related with RES values.

In conclusion, the magnitude of the adaptation of REE to calorie restriction depends on the intensity of the energy deficit. Whether thermogenic proteins/hormones released by the body are responsible for this adaptation remains to be studied.

## T1:PS.147

**The effect of a lifestyle intervention on visceral fat, liver fat and intramyocellular lipids in obese men.**

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Visceral fat, liver fat and intramyocellular lipids (IMCL) are associated with increased risk of type 2 diabetes. We have investigated the role of weight loss through diet and exercise in modulating these energy stores in 18 obese non-diabetic men.

Fat distribution was measured using Dual energy X-ray absorptiometry (DEXA), magnetic resonance imaging (MRI) and spectroscopy (MRS) while insulin sensitivity was assessed using homeostasis model assessment (HOMA). The exercise sessions were recorded with a heart rate monitor and dietary intake was assessed by 3 day diet diaries before and after the intervention.

During the intervention, subjects achieved an average 1207±971 kcal exercise per week. VO<sub>2</sub>max increased by 5.1±3.2 mL O<sub>2</sub>·Kg of FFM<sup>-1</sup>·min<sup>-1</sup> while HOMA decreased by 0.9±2 (p<0.05). Furthermore, the subjects had mean decrease of 20.1±11.5% total body fat, 28.9±18.0% visceral fat, 14.5±11.3% abdominal subcutaneous fat and 54.1±30.0% liver fat (p<0.05). IMCL of soleus muscle was decreased by 9.1±27.3% (p=0.093). Subjects who exercised more had a greater decrease in visceral fat (duration: p=0.037; Kcal: p=0.052). HOMA was correlated to liver fat before and after the intervention (p<0.05), but was not associated with visceral fat or IMCL. Also, the decrease in liver fat was correlated with decreases in plasma lipids (p<0.05). The reduction in IMCL with the intervention was associated with restriction in caloric intake (p=0.003) independent of amount of weight loss.

These data suggest that liver fat correlates with metabolic parameters, visceral fat reduction is associated with exercise and IMCL are regulated by energy intake in obese non-diabetic men.

**Funding:** This study was funded by a National Health and Medical Research Council (NHMRC) Health Research Partnership Grant.

## T1:PS.149

**Different Effects of Roux-en-Y Gastric Bypass (RGYB), Sleeve Gastrectomy (SG), and Medical Treatment (MED) of Obesity on PYY, Hunger and Satiety, for Similar Magnitudes of Weight Loss: A Preliminary Report.**

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Obesity surgery has proved being more success than MED. This can not be explained only by anatomical restriction but also by changes in hunger which could be related to gut hormones responses.

**Objective:** To evaluate changes produced by three treatments for obesity on PYY levels, satiety and hunger with similar excess weight loss (EWL).

**Method:** Prospective study. Three groups of obese patients, RGYB (3), SG (3) and MED(5), BMI 31-47 kg/m<sup>2</sup>, aged 23-52, before and after two months on MED, RGYB and SG. We assessed plasma PYY 3-36 (RIA, Linco, USA), hunger and satiety by visual analogue scales, before and after 30, 60, 90, 120, 180 minutes post-intake of 237ml of a standard meal (Ensure Plus®). Area under curve (AUC) was calculated for each measure by trapezoidal method and the results were analyzed by general linear model for serial measurements followed by post hoc analysis by Bonferroni test.

**Results:** Subjects had similar EWL after treatment (range 45-51%). PYY showed a significant difference between MED and both surgical procedures.

AUC	PREMED	POSTMED	PREGBYR	POSTGBYR	PRESG	POSTSG	p
PYY 3-36 (pmol·ml <sup>-1</sup> ·min)	11838±2406	10417±873	24142±8670	39143±214	16542±8917	33835±8901	0,0028
Hunger (mm/min)	4356±2170	5658±2745	6905±4845	905±680	9730±3600	4145±3692	0,06
Satiety (mm/min)	7767±5663	7818±4685	10820±1303	16535±832	9080±3091	13400±2341	0,06

**Conclusion:** Bariatric surgery increases significantly PYY for a similar EWL unlike MED. This might be related to a change in hunger and satiety. Our study showed a tendency for an increment in satiety and a decrease in hunger. A bigger sample size might show more conclusive results.

## T1:PS.150

**Tks1225, a novel oxyntomodulin analogue, reduces food intake and body weight and improves glycemic control in diet rats**Cooke, D<sup>1</sup>, Edwards, J<sup>1</sup>, Bloom, S<sup>1</sup>, Burt, J<sup>1</sup>, Olverling, A<sup>2</sup>, Tang-Christensen, M<sup>2</sup><sup>1</sup> Thiakis Limited, London, UK; <sup>2</sup> Rheoscience, Copenhagen, Denmark

Repeat administration of oxyntomodulin has been shown to reduce food intake in rodent models and cause weight loss in humans. TKS1225 is a potent, long acting analogue of oxyntomodulin.

Randomised groups (n=10-12) of male diet-induced obese (DIO) rats received daily subcutaneous injections of a saline solution of either 5, 15 or 45 nmol/kg TKS1225, and were presented with high fat chow and water ad libitum. Food intake and body weight were measured for 60 days in comparison to a control group dosed with saline.

Chronic treatment with 5, 15 and 45 nmol/kg TKS1225 led to a dose-dependent decrease in food intake (not shown) and body weight at day 60 of 17.7 % ± 1.8; 21.2 % ± 1.0; and 26.3 % ± 1.9 relative to control respectively (all p<0.05).

An oral glucose (2 g/kg) tolerance test on day 54 followed an 18 hour semi-fast (17 hours post dose). Animals in the 5, 15 and 45 nmol/kg TKS1225 treatment groups had improved glucose tolerance. AUC (T<sub>30</sub> - T<sub>240</sub> mins relative to glucose challenge) glucose (mM\*min) was 2162 ± 46; 2046 ± 40; and 2031 ± 61 compared to vehicle (2414 ± 42) respectively (all p<0.05), whilst AUC insulin (x10<sup>3</sup>) (pM\*min) was 89.4 ± 8.0; 81.9 ± 6.0; and 95.9 ± 15.0; compared to vehicle (174.0 ± 12.2) respectively (all p<0.05).

Clinical studies of TKS1225 as a potential agent for the treatment of obesity and related metabolic co-morbidities are being initiated.

## T1:PS.152

**Dietary proteins and serine proteases stimulate secretion of satiety hormones by the stc-1 cell line**Maartje C. P. Geraedts<sup>1</sup>, Freddy J. Troost<sup>2</sup>, Wim H.M. Saris<sup>1</sup>

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Ingestion of high-protein diets induce elevated levels of the satiety hormones CCK and GLP-1 in the blood. Serine proteases such as trypsin and dipeptidyl peptidase IV (DPP IV) have been shown to be involved in the regulation of release and activation of these hormones. This study investigated whether dietary proteins are able to stimulate the secretion of CCK and GLP-1 through inhibition of serine proteases.

Eleven dietary proteins (casein-hydrolysate, codfish, egg, egg-hydrolysate, ovomucoid, pea, sodium-casein, soybean, wheat, wheat-hydrolysate, and whey) were tested on their effects on satiety hormone secretion. Effects of the proteins were determined by incubating STC-1 cells with either a protein, or a combination of a protein with trypsin or DPP IV. CCK and GLP-1 levels were determined in the supernatant.

Egg-hydrolysate, pea, sodium-casein, and wheat stimulated CCK release, whereas codfish, egg, egg hydrolysate, sodium-casein, wheat, and whey stimulated release of GLP-1. Addition of a combination of trypsin and casein hydrolysate, codfish, egg, egg hydrolysate, sodium casein, wheat-hydrolysate, or wheat resulted in an additional stimulation of CCK release, compared to the exposure to only the protein. Addition of a combination of DPP IV and egg hydrolysate, ovomucoid, or sodium casein decreased GLP-1 levels.

This study showed that inhibition of trypsin or DPP IV by several different dietary proteins stimulated the secretion of CCK and GLP-1. We conclude that these proteins exert strong effects on satiety hormone release, and may therefore be potent dietary supplements for the prevention or treatment of obesity.

## T1:PS.151

**An improvement of sympathovagal balance after hypoxia exposition before a physical activity program for obese patients**Gazeau, F<sup>1</sup>, Lagger, G<sup>2</sup>, Golay, A<sup>2</sup><sup>1</sup>Personal Trainer, Geneva, Switzerland<sup>2</sup>Therapeutic Patient Education Service, SETMC, Geneva University Hospital, Switzerland

It is known that obesity is often correlated with a low cardiac variability. Due to the excess load to carry, the obese patients may enter into a vicious circle similar to the athlete "over training". This is characterized by an altered mood state, chronic fatigue and sleep disorders, all of these lowering the quality of life. Moreover, this condition is linked to an increased cardio-vascular risk amongst obese patients.

The objective of the study was to assess whether a passive exposition to hypoxia could be related to a modification in the sympathovagal balance of obese patients.

In this study, 8 patients followed a protocol where the cardiac variability was measured 1 day before, 1 hour after and 24 hours after a 1 hour passive (maintaining a lying position) exposition to hypoxia (blood O<sub>2</sub> saturation maintained between 70 and 75%).

The results show that the sympathovagal balance of the patients was significantly increased from basal (2.0 ± 1.2) to post-exposition (3.0 ± 2.1) (p<0.05) and significantly decreased, compared to basal, 24 hours after exposition (0.8 ± 0.5) (p<0.01).

In conclusion, a passive hypoxia exposition is leading to an improvement in the sympathovagal balance at 24 hours. This approach could allow obese patients to walk out from the chronic fatigue and altered state, which seem essential before starting a physical activity training program.

## T1:PS.153

**Men and women show equivalent changes in body weight and body composition in response to exercise: the importance of compliance.**King, NA<sup>1</sup>, Hopkins, M<sup>1</sup>, Caudwell, P<sup>2</sup>, Stubbs, RJ<sup>3</sup>, Naslund, E<sup>4</sup>, Blundell, JE<sup>2</sup>.

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<sup>3</sup>Slimming World, Derbyshire, UK.<sup>4</sup>Dept of Clinical Sciences, Danderyd Hospital, Karolinska Institutet, Sweden.

It is uncertain whether reports of a gender difference in exercise-induced weight loss is due to variability in physiological regulation or is a consequence of reduced compliance.

It was hypothesised that if the exercise was mandatory, men and women would respond similarly with respect to body weight and composition. Fifty eight overweight and obese men (n=19) and women (n=39) with mean BMI=31.8 ±4.5 kg/m<sup>2</sup>, age=39.6 ±9.8yrs and VO<sub>2</sub>max= 29.1 ±5.7ml/kg/min completed 12 weeks of supervised exercise. Body weight (Bwt), fat mass (FM), VO<sub>2</sub>max, blood pressure (BP), resting heart rate (RHR) and waist circumference (WC) were measured at weeks 0 and 12.

Total accumulative exercise-induced energy expenditure was not significantly different between men (498 ±103 kcal/kgFFM) and women (447 ±94.0 kcal/kgFFM). Men (-3.12 ±4.0kg) and women (-3.33 ±3.0kg) experienced a significant reduction in Bwt after 12 weeks (t=3.39, p<0.0001 and t=6.93 p<0.0001 respectively). FM and WC decreased significantly in men (2.45 ±4.63kg; 5.58 ±3.76cm) and women (3.14 ±2.55kg; 4.56 ±3.19cm). There was no statistical difference in the decreases in Bwt (t=.23, p=0.82), FM (t=0.70, p=0.49) and WC (t=1.07, p=0.29) between men and women. Men and women also experienced similar health benefits including significant decreases in BP and HR. These data suggest that when the exercise prescription is mandatory and completed, men and women experience the same body weight and composition benefits. These data provide an important and positive health message; women do experience the weight loss benefits associated with exercise when the exercise is completed.

This project was funded by the Biotechnology and Biological Sciences Research Council (BBS/B/05079).

## T1:PS.154

**Endocrine Adaptations to Short Term Fasting are Preserved after Gastrectomy but Impaired in Morbid Obesity**

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<sup>3</sup>Department of Metabolic Medicine, Imperial College, London UK

**Background:** Fasting is associated with increased growth hormone (GH) pulses and mobilisation of fats, but underlying mechanisms are unclear.

**Aims:** To determine whether ghrelin orchestrates the metabolic changes seen during fasting, and whether administering ghrelin to subjects with low ghrelin affects lipid mobilisation.

**Subjects and Methods:** 10 lean controls (BMI 23.3±3.2), 10 morbidly obese subjects (BMI 50.1±10.6) and 6 post-gastrectomy subjects (BMI 25.2±1.0) were fasted for 36 hours with regular blood sampling. On a separate occasion subjects were infused with either intravenous ghrelin (5 pmol/kg/min) or saline over 270 minutes.

**Results:** Obese and post-gastrectomy subjects had lower ghrelin levels compared to controls (ANOVA  $p=0.02$ ) during the fast. Controls and gastrectomy subjects showed a similar increase in GH pulsatility, circulating NEFA and -hydroxybutyrate. Obese subjects had an impaired GH response ( $p<0.001$ ), reduced -hydroxybutyrate ( $p=0.01$ ) and a borderline reduction in NEFA ( $p=0.09$ ) compared to lean controls. Ghrelin infusion increased GH, NEFA and ketone bodies (ANOVA  $p<0.0001$ ) in all three groups, but GH response was impaired in the obese ( $p=0.001$ ). Ghrelin also induced a biphasic NEFA response to meals which was not present during the saline infusion.

**Conclusions:** Obese and gastrectomized subjects both have low ghrelin levels, but have different responses to fasting in terms of GH, NEFA release and ketone body formation. Therefore ghrelin is unlikely to explain the metabolic changes seen during fasting. Ghrelin induced a marked biphasic response in NEFA, which may represent increased metabolic flexibility - low ghrelin may contribute to reduced metabolic flexibility in obesity.

## T1:PS.156

**Effect of nutrient intake and genetic polymorphisms on rates of overweight/obesity in Asian and White Americans.**

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**Background:** More than two thirds of US adults are overweight or obese. Although socio-economic factors play a role in the differences in obesity between ethnic groups, genetic factors and nutrient intake should also be examined.

**Methods:** Using food frequency questionnaires on 3000 White Americans and 1200 Asian Americans we investigated the role nutrient intake on BMI. We also compared the role of 22 genetic polymorphisms reported in the literature to be involved in nutrient metabolism or obesity.

**Results:** Intake of vitamin B and E supplements, caffeine, saturated fat and refined carbohydrates was much higher in Whites ( $p<1 \times 10^{-20}$ ) than in Asians. Intake of cruciferous vegetables, vitamin A and allium was significantly higher in Asians. Some consistent effects were seen in both ethnic groups: the odds ratio for obesity for each additional SD of saturated fat intake was 1.49 (95%CI 1.26-1.76) in whites and 1.46 (95%CI 1.10-1.95) in Asians. For vitamin A the values were OR=0.82 (95%CI 0.71-0.99) in whites and OR=0.53 (95%CI 0.32-0.88) in Asians. Only a variant in the GSTP1 gene was significantly associated with BMI in whites, and a variant at the CBS gene in Asians. However, a different GSTP1 variant was significantly associated with BMI in whites but only among individuals with low vitamin A intake and not in those with high intake.

**Conclusions:** The role of vitamin A on obesity is consistent with results from animal models. Our data illustrate the complexity of genetic and nutrient determinants of BMI and obesity, and show consistent patterns in two ethnic groups.

1. Conflict of Interest: This work was funded in part by Sciona Inc., Boulder, CO, USA. R. Gill is an employee of Sciona Inc, and K. Grimaldi is a consultant to Sciona Ltd. I. Arkadianos is a distributor of Sciona products in Greece

2. Funding: The contribution of Sciona (KAG, RDG) was partially supported by the European Commission under the FP6-IST4-027333 project "Micro2DNA: Integrated polymer-based micro fluidic micro system for DNA extraction, amplification, and silicon-based detection

## T1:PS.155

**Mastication of Almonds: Effects on Appetite, Gut Peptides and Metabolizable Energy.**

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Epidemiological and clinical data indicate that almonds can be incorporated into the diet without promoting weight gain. This has been attributed to their strong satiety effects, stimulation of resting energy expenditure and limited bioaccessibility of the fat they contain. The mechanisms responsible for these properties have not been elucidated. The present cross-over design study focused on the role of mastication. Following an overnight fast, 13 healthy adults chewed 55g of almonds 10 (C10), 25 (C25) or 40 (C40) times while blood was collected via catheter and appetite was monitored on visual analog scales for 6 hours. Following this, all foods were provided to participants for the next 4 days including daily 55g almond portions that were consumed under the same chewing conditions. Complete fecal samples were collected. This was repeated for each chewing condition in randomized order with a 1 week washout between trials. Hunger was suppressed below baseline longer with C25 compared to C40 ( $p=0.01$ ) and tended to be lower compared to C10 ( $p=0.057$ ). Fullness was elevated over baseline longer with C25 compared to C10 ( $p=0.018$ ) and C40 ( $p=0.014$ ). There was no significant treatment effect on plasma ghrelin, GLP-1 or PYY. There was a trend for a time by treatment interaction for GLP-1 ( $p=0.055$ ) where initial concentrations were lower for C25. Fecal fat was significantly higher after C10 compared to C25 or C40 (both  $p<0.05$ ) These data indicate that oral processing of almonds influences appetitive responses and the efficiency of fat absorption, but the two are not related.

**Funding:** Supported by a grant to RM by the Almond Board of California.

## T1:PS.157

**Amygdala insulin suppresses food intake**

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Insulin has been suggested as a longterm regulator of energy balance, acting on the arcuate-paraventricular pathways to inhibit food intake and regulate energy metabolism. Insulin receptors are widely expressed in the brain, including in other areas, such as the amygdala, that are affect feeding behavior. The purpose of this study was to investigate if insulin was effective within the amygdala to inhibit food intake and if this response was influenced by dietary fat composition. Male Sprague-Dawley and S5B/Pl rats adapted to a low fat (10% energy) or high fat (40% energy) diet for 10 days after surgical implantation of guide cannulas to deliver drugs to the central bed nucleus of the amygdala (CBNA) or the third ventricle to deliver drugs to the arcuate -PVN region. In our experiments, insulin (4 or 8mU) given ic3v had no effect on food intake. In contrast, insulin (8mU) delivered onto the CBNA significantly inhibited food intake of SD rats fed the low fat diet over a 24 hour period. This effect was not observed in SD rats fed the high fat diet. Insulin tolerance tests indicated peripheral insulin resistance in these rats. Likewise S5B rats showed a CBNA insulin response that was diet dependent but in this case there was no evidence of peripheral insulin resistance on the high fat diet. These data suggest the CBNA as a site of insulin anorectic action and that central insulin resistance may develop in parallel to (SD rats) or before (S5B/Pl rats) peripheral insulin resistance.

## T1:PS.158

**The effect of fructose solution (10 %) in the diet of rats on the plasma and hypothalamic expression of ghrelin and leptin**Handjieva-Darlenska T.<sup>1</sup>, Boyadjieva N.<sup>1</sup><sup>1</sup>Department of pharmacology and d toxicology, Medical Faculty, Medical University - Sofia

**Introduction:** Ghrelin and leptin are hormones, involved in the regulation of appetite and food intake. Ghrelin is derived from the stomach and has orexigenic effect, whereas leptin is secreted by the fat tissue and decreases appetite. It is still unclear how fructose-rich diet affects the plasma levels of ghrelin and leptin.

**Aim:** The purpose of this study was to investigate the effect of fructose on the plasma and hypothalamic expression of ghrelin and leptin.

**Materials and methods:** We used 20 male Wistar rats. Rats were divided into two groups:

the first group (experimental, n=10) received a 10 % fructose solution plus chow food; the second group (control, n=10) was fed with standard chow food *ad libitum*. Both groups were fed for a 13 - week period. Body weight was measured every week. At the end of the nutritional period rats were anesthetized and decapitated. Blood was collected for biochemical measurement of triglycerides, cholesterol and glucose. Hypothalamus and plasma were taken for determination of ghrelin and leptin with ELISA (Biovendor) and Western Blot methods.

**Results:** At the end of the 13<sup>th</sup> week body weight of the experimental group was significantly higher than the control group. Moreover, the plasma triglycerides and cholesterol levels were increased in the experimental group. Fructose administration in drinking water induces obesity and changes in lipid metabolism. Our results demonstrate the change of plasma ghrelin and leptin and difference in control and obesity group.

**Conclusion:** Further investigations are needed to clarify the role of fructose-rich diet on the plasma and hypothalamic expression of ghrelin and leptin.

## T1:PS.160

**The pre-meal priming of gastrointestinal satiety factors does not affect short-term energy intake in normal weight men.**

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**Background:** Although experimental studies on meal frequency are few, results tend to show that increasing the number of daily meals leads to decreased energy intake (EI). No studies have yet looked at the type of meal patterning that would maximize this effect.

**Objective:** The purpose of this study was to determine if timed preloads impact on EI, appetite, and PYY and GLP-1 concentrations.

**Design:** Eight normal weight men (79.9 ± 11.1 kg) participated in 3 full-day randomly assigned experimental conditions. In condition 1 (C1), subjects self selected their meals and snacks *ad libitum*. In condition 2 (C2), subjects consumed a standardized preload (300 Kcal: 40 % protein, 40% carbohydrate and 20 % fat) 15 minutes prior to lunch and dinner. During condition 3 (C3), subjects consumed the preload, at times that maximized their pre-meal fullness levels. During each condition, a standardized breakfast was served, while lunch and dinner were self-selected from a 5 item menu, and eaten *ad libitum*. Daily EI, fasting and postprandial appetite, PYY, and GLP-1 were sampled every 30 minutes for 9 hours for all 3 conditions.

**Results:** No difference in daily EI, AUC GLP-1, and PYY was noted between conditions. Pre-meal peptide levels tended to be higher during C3. Desire, hunger, and PFC were lowest during C1 (P<0.05). GLP-1 concentrations were correlated to fullness levels during C1 (R=0.81, P<0.05) and C3 (R=0.89, P<0.01).

**Conclusion:** Maximizing pre-meal fullness with preloads does not affect short term EI.

**Key words:** Energy intake, appetite, PYY, GLP-1, preload, meal frequency

**Funding:** Canadian Institute of Health Research

## T1:PS.159

**Effect of different protein contents in a liquid preload on subsequent voluntary food intake and mood in men and women**Stevenson, E<sup>1</sup>, Astbury, N<sup>2</sup>, Taylor, M<sup>2</sup>, Morris, P<sup>3</sup>, Macdonald, I<sup>2</sup>.<sup>1</sup>Northumbria University, Newcastle upon Tyne, UK; <sup>2</sup>University of Nottingham, Nottingham, UK; <sup>3</sup>Mars Inc, Melton Mowbray, Leicestershire, UK

This study investigated the effect of the whey protein content of a liquid preload on subsequent food intake in men and women. Twelve male and twelve female non-obese healthy subjects completed four trials in a randomised cross-over design. All subjects were unrestrained eaters. Subjects were provided with a standard breakfast on the morning of each trial and then reported to the laboratory at 11am. Subjects completed baseline visual analogue scales (VAS) and then consumed the liquid preload. Further VAS were completed immediately post preload and at 30 min intervals for 90 min. Subjects were then provided with an *ad libitum* pasta meal. The preloads contained 0% (water), 12.5%, 25% or 50% energy from whey protein. Protein preloads were isocaloric (400 kcal) and isovolumetric. Following the 50% preload, male subjects consumed less energy at lunch than following the 12.5% and 25% preloads (P < 0.005). There were no differences in energy intake at lunch following the protein preloads in female subjects. There were no differences in total energy intake throughout the protocol in the male subjects but total energy intake was higher following the protein preloads than following water for female subjects (P < 0.05). Male subjects reported no differences in VAS ratings of hunger, fullness and desire to eat between trials. Female subjects reported higher hunger and lower fullness and desire to eat scores in the water trial compared to the protein trials (P < 0.05). Whey protein has differential effects on food intake and appetite in male and females.

## T1:PS.161

**The effect of vitamin d replacement on fat-free mass**Fackler, S<sup>1</sup> Tanton, D<sup>1</sup><sup>1</sup>Wilford Hall Medical Center, San Antonio, Texas, United States

While the current body of medical literature does recognize the surprising prevalence of Vitamin D deficiency, particularly in the overfat population, it does not provide conclusive evidence that replacing Vitamin D stores will result in favorable changes to body composition. The purpose of this study, therefore, is to prospectively examine the effects of Vitamin D repletion on fat-free mass. Overweight and obese patients from our Endocrinology Clinic will be screened for Vitamin D deficiency, electrolyte abnormalities, and renal dysfunction. Those individuals whom are determined to be Vitamin D deficient (as defined by a 25-Hydroxyvitamin D of less than 30 ng/ml) will have a baseline fat mass determination using a Tanita Body Composition Analyzer Goal Setter (Model TBF-310) and will be started on weekly, high-dose Vitamin D<sub>2</sub> (50,000 International Units) for a duration of 3 months (This dose and / or frequency may vary if the patient is known to have malabsorption.). Once Vitamin D replacement is complete, a post-treatment fat mass analysis will be performed (using the same Tanita Body Composition Analyzer) and a repeat 25-Hydroxyvitamin D level (along with serum calcium, phosphorus, and creatinine) will be drawn for comparison. We anticipate an enrollment of approximately 50 overfat, Vitamin D deficient patients, thereby powering this small, pilot study to reliably detect a 3% difference in body fat. We hope to demonstrate that the percentage of fat-free mass in overweight and obese Vitamin D deficient patients will be positively impacted by the repletion of Vitamin D stores.

## T1:PS.162

**The effects of dietary protein intake during sow gestation on adipose tissue features in the offspring: preliminary data**

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This study aimed to determine whether maternal dietary protein level affects adipose tissue features of the resulting offspring at birth and later in age. Sows were fed control (C, 12% protein), low-protein (LP, 6% protein), or high-protein (HP, 30% protein) diets throughout pregnancy. Birth weight was lower ( $P < 0.01$ ) in LP ( $1.14 \pm 0.03$  kg;  $n = 114$ ) and HP ( $1.25 \pm 0.03$  kg,  $n = 87$ ) piglets than in C piglets ( $1.36 \pm 0.02$  kg,  $n = 136$ ). At day 1 of age, the percentage of subcutaneous fat tended to be higher ( $P = 0.10$ ) in LP piglets ( $11.29 \pm 0.27$ ) than in C piglets ( $10.6 \pm 0.27$ ), whereas it did not differ between HP ( $10.6 \pm 0.28$ ) and C animals. Concurrently, the specific activities of fatty acid synthase and malic enzyme, two lipogenic enzymes, were enhanced by 63% ( $P = 0.01$ ) and 55% ( $P = 0.06$ ), respectively, in subcutaneous fat of LP piglets compared with C piglets, whereas no differences were observed in these traits between HP and C piglets. Preliminary proteomic investigations using 2-dimensional gel electrophoresis ( $n = 6$  per each group) revealed 37 spots significantly different in abundance (fold-change  $> |1.3|$ ,  $P < 0.05$ ) in subcutaneous fat from LP piglets vs. C animals; 11 spots differed between HP and C piglets. Differentially-expressed proteins will be further identified, and eventually studied at 185 days of age. In conclusion, preliminary data suggest that maternal protein deficiency could affect body composition and adipose tissue traits in the offspring at birth.

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## T1:PS.164

**Impact of time interval between meal and exercise on substrates oxidation during exercise and recovery in obese children**

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**Introduction:** we aimed at investigating the effect of time interval between breakfast and a cycling exercise on fat and carbohydrate (CHO) oxidation during exercise in obese children. We hypothesized that fat oxidation might be reduced when exercise is performed 1h compared with 3h after a breakfast due to a high CHO bioavailability.

**Methods:** 9 obese children (Age:  $10.21 \pm 1.72$ ; BMI:  $23.4 \pm 6.4$  kg.m<sup>-2</sup>; %Fat:  $36.043 \pm 6.11$ ) performed a 30-minute cycling exercise 1 h in one session and 3 h in another session after a standardized breakfast at 50% of maximal aerobic power measured during a maximal exercise testing ( $VO_2$ max:  $1.491 \pm 0.385$  l.kg<sup>-1</sup>.min<sup>-1</sup>). Rates of fat and CHO oxidation calculated from gas exchange measurement were expressed relative to lean body mass (LBM).

**Results:** Respiratory Exchange Ratios were similar in both conditions (1h:  $0.97 \pm 0.03$ ; 3h:  $0.97 \pm 0.02$ ). Rates of fat (1h:  $1.42 \pm 1.10$  mg.kgLBM<sup>-1</sup>.min<sup>-1</sup> vs 3h:  $1.38 \pm 0.84$  mg.kgLBM<sup>-1</sup>.min<sup>-1</sup>) and CHO (1h:  $27.86 \pm 11.28$  mg.kgLBM<sup>-1</sup>.min<sup>-1</sup> vs 3h:  $30.79 \pm 12.76$  mg.kgLBM<sup>-1</sup>.min<sup>-1</sup>) were not significantly different between the two conditions.

**Discussion:** During a moderate intensity cycling exercise obese children rely almost totally on CHO whether they are fed 1h or 3h before exercising. Exercising at distance from breakfast does not favour fat oxidation in obese children.

## T1:PS.163

**A new programme on patient motivation for physical activity**

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Physical activity has a preponderant role in long term body weight maintenance. In the past, programmes had only a feeble impact on patient motivation for physical activity: little mobility during hospitalization and few planned changes in this area at the end of the stay. However, patients have to see physical activity as a priority.

**Objective:** To help patients understand the importance of physical activity, and make them experiment it daily during a 15-days hospitalization weight loss programme.

Theory and practice about physical activity were continuously linked together. A specific communication was adopted with the patient: advices and repeated messages were replaced by a knowledge building taking into account the patients' representations. A systematic follow up of patients helped them to express their feelings during and after the experimentations as well as about their past experiences. The practice consisted in adapted physical activities conducted each day of the hospitalization and implemented following a progressive intensity. This was made according to the patient's pleasure and with the aim of providing them a positive experience.

At the end of the programme, the patients' response to this intervention was evaluated as well as the implication of helpers, the impact of the group and the safe and non-judgmental framework.

**In conclusion,** patients made links between the experimented physical activity and their body weight loss. They could experiment it with pleasure, this opening perspectives for patients to introduce changes in their life..

## T1:PS.165

**Contribution of resting energy expenditure to weight gain in young children – a longitudinal study**

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**Background:** Resting energy expenditure (REE), the largest component of total daily energy expenditure, is potentially important in the regulation of body weight. However, its role remains controversial and little is known of its contribution to weight gain or changes in body composition (fat mass and %fat) in children.

**Aim:** Evaluate the contribution of REE at 7y to weight gain and changes in body composition over 36 months.

**Methods:** REE by indirect calorimetry and body composition by DEXA were measured in 179 children (97 boys) from the EarlyBird cohort, annually from 7y to 10y. The effect of REE at 7y on subsequent change in weight, excess weight (SDS), and body composition was analysed using linear mixed effects models with body composition and age at baseline entered as covariates.

**Results:** In girls there were small but statistically significant negative associations between REE at 7y and subsequent change in fat mass ( $\sim -0.1$  kg/year/100kcal,  $p = 0.01$ ), %fat ( $\sim -0.4\%$ /year/100kcal,  $p = 0.0002$ ), and excess weight ( $\sim -0.02$  sds/year/100kcal,  $p = 0.01$ ). In boys there were no significant effects of REE at 7y on change in fat mass, %fat or weight SDS (all  $p > 0.34$ ) but a small positive association was found between REE at 7y and change in weight ( $\sim 0.2$  kg/year/100kcal,  $p < 0.001$ ).

**Conclusion:** The association between REE and change in weight and body composition was small yet statistically significant, together suggesting with some certainty that REE has little impact on the wide variation in weight gain at this age.

**Funding:** The EarlyBird Study is currently funded by: The Bright Futures Trust, the Child Growth Foundation, the EarlyBird Diabetes Trust, GSK, the Kirby Laing Foundation, Nestle, Novo Nordisk.

## T1:PS.166

**The effect of nutritional education on knowledge and attitude about fruits, vegetables and dairy products consumption importance in primary school girls in Tehran local (zone 2).**

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**Background & purpose:** Today, incorrect child's food pattern, specially clear reduction in fruit, vegetable and dairy products consumption, is one of the most important anxiety of our world. This matter affect child's growth and health. Food selection of this susceptible group is affluent by their knowledge and attitude. In Iran, some studies have been done about the impact of nutrition education on child's knowledge and attitude but the emphasis on fruit, vegetable and dairy product were rare. Also, education sustainability didn't considered. So this survey has been done to determine the impact of nutrition education on knowledge and attitude about fruits, vegetables and dairy products consumption importance in local (zone2) primary school girls in Tehran.

**Material & methods:** This experimental study has been done on 187 4<sup>th</sup> grade primary school girls who were selected by polyhedron racemose sampling method from 6 local (zone2) primary school in Tehran who were randomly distributed into 2 groups: first group educated by lecture as case and non educated group as control. Data were gathered via a self-administered questionnaire that consisted of 3 section: general, knowledge and attitude questions that it's reliability and validity was confirmed by experienced experts and a pilot study, through pre-test and 2 post-tests that was done before, 1 & 3 weeks after education intervention respectively. Education was performed as lecture through 3 one-hour sessions by a nutritionist for case group and no education for controls. Data were analyzed by SPSS/WIN soft ware.

**Results:** Knowledge and attitude levels of each 2 groups, case and control, didn't show significant differences before intervention. After intervention, the mean of knowledge score showed significant increase in case group to compared with control and before education in 2 post-tests ( $p < 0.001$ ). The attitude score mean in 2 post-tests to compared with control and before intervention, showed significant statistical differences ( $p < 0.001$ ) but these differences weren't considerable.

**Conclusion:** The results of this study showed that, nutrition education via lecture significantly increased score levels in case group to compared with controls and before education. This increase in knowledge level had good sustainability in long time (after 3 weeks), but this education didn't have considerable effect on students attitude.

**Key words:** school girls, nutrition education, knowledge, attitude, vegetable-fruit-dairy product

## T1:PS.168

**Recent advances in nutraceutical research: How to manage sustainable body fat loss and reduce inflammation of adipose tissue**Spät S.<sup>1</sup>, Bell D.<sup>1</sup>, Weidner C.<sup>1</sup><sup>1</sup>Cognis Germany GmbH, Mohnheim, Germany

Obesity is a significant risk factor for metabolic diseases, such as atherosclerosis and heart disease. There is emerging evidence that excess adipose tissue, acting as an endocrine organ, may contribute to systemic "silent" inflammation. Therefore, our objective was to illuminate how further insight into adipose tissue metabolism could help identify nutraceutical ingredients which may reduce obesity related health risks.

Excess adipose tissue produces and secretes circulating factors, or 'inflammatory' mediators that may act at distant sites as key modulators of risk for a number of chronic diseases such as insulin resistance, atherosclerosis, and dyslipidaemia. In obese subjects, levels of several pro-inflammatory cytokines, including TNF $\alpha$ , IL-6 and leptin were significantly higher compared to nonobese. Recently it was reported that even in normal weight subjects with body fat masses >30%, plasma levels of TNF- $\alpha$  and IL-6 were elevated. Epidemiology shows that weight loss as such does not reduce CVD risk, while fat loss does. Therefore, fat loss represents a safe method for downregulating the inflammatory state and may improve various aspects of health such as risk for diabetes or coronary disease.

Evidence is growing that several fat loss enhancing ingredients, like green tea, guarana or CLA may help to sustainable counteract obesity related inflammation. More than 30 clinical studies have demonstrated that CLA, a naturally occurring dietary fatty acid, reduces body fat mass while maintaining lean body mass. While CLA may not reduce obesity induced inflammation per se, it may modulate the immune response associated with the chronic inflammation.

## T1:PS.167

**The effect of body fat distribution on the physiological response to a dietary fat intervention**Pasman, WJ<sup>1</sup>, de Graaf, AA<sup>1</sup>, Freidig, AP<sup>1</sup>, Vaes, WHJ<sup>1</sup>, Verheij, ER<sup>1</sup>, Bobeldijk, I<sup>1</sup>, Wortelboer, HM<sup>1</sup>, Hendriks, HFJ<sup>1</sup><sup>1</sup> TNO Quality of Life, Zeist, the Netherlands

Not total body fat, but especially fat accumulated in the abdominal site resulting in upper body obesity (UBO) seems to be related with increased metabolic risk. In a previous study we found that a nine day dietary fat intervention affected subcutaneous fat characteristics of lean and overweight subjects. In the present study we examined the differences in subcutaneous fat characteristics and fat metabolism in overweight men with UBO or lower body obesity (LBO).

In a cross-over trial 12 male subjects (age 51 $\pm$ 7 y; BMI 28.5 $\pm$ 0.8 kg.m<sup>-2</sup>) consumed medium chain fatty acids (MCFA) (C8-C10: 65%; C16: 29%; > C18: 6%) or poly-unsaturated fatty acids (PUFA) (< C16: 1%; C16: 28%; > C18: 71%) for three weeks, by replacing in total 60 grams of their normal spread intake by the fat supplement. Handling of the consumed fatty acids is hypothesized to be different in UBO (n=5; WHR 1.04 $\pm$ 0.05) or LBO (n=7; WHR 0.97 $\pm$ 0.02) men due to their fat disposition and the routing of these fatty acids. MCFA will be transported directly to the liver, while PUFA will be absorbed by the chylomicrons via the lymph and transported through the body to the periphery.

The effect of the spread supplements on lipoprotein profile, protein synthesis (lipoprotein and adiponectin), fatty acid metabolism in blood and fat tissue was measured with stable isotopes (<sup>3</sup>H<sub>3</sub>-Leucine enrichment; and U-<sup>13</sup>C18 and <sup>13</sup>C4-octanoic acid, resp.), which were supplied intravenously and orally. It is hypothesized that PUFA spread will preferentially dispose fat in the periphery affecting lipoprotein and adiponectin production.

Results of the study will be presented at the congress.

**Funding:** This study was financially supported by Dutch government through grant "Healthy nutrition" (grant number 04003)

## T1:PS.169

**Variants in the FTO gene are associated with common obesity in the Belgian population.**Peeters, A<sup>1</sup>, Beckers, S<sup>1</sup>, Verrijken, A<sup>2</sup>, Roevens, P<sup>3</sup>, Peeters, P<sub>3</sub>, Van Gaal, L<sup>2</sup> and Van Hul, W<sup>1</sup><sup>1</sup> Center for Medical Genetics, Department of Biomedical Sciences, University of Antwerp (UA) and University of Antwerp Hospital, Antwerp, Belgium<sup>2</sup> Department of Diabetology, Metabolism and Clinical Nutrition, University of Antwerp (UA) and University of Antwerp Hospital, Antwerp, Belgium<sup>3</sup> Department of Enabling Technologies Biology of Johnson & Johnson Pharmaceutical Research & Development, a division of Janssen Pharmaceutica NV, Beerse, Belgium.

**Introduction:** Previous studies reported association between FTO (Fat mass and obesity associated) SNPs and obesity, in European cohorts. We genotyped the SNPs showing the strongest association in the first two studies, rs1421085 and rs9939609, to assess whether FTO genotype contributes to the development of obesity in the Belgian population. Furthermore, we investigated whether rs1421085 is associated with obesity parameters in adult obese individuals.

**Material and methods:** Anthropometric and bio-impedance measurements were obtained for 1099 obese patients and 268 healthy controls. Visceral (VFA), subcutaneous (SFA) and total abdominal (TFA) fat areas were measured with a CT scan at the L4-L5 level. Hyprobe genotyping was done on a LightCycler LC480. Odds ratios (OR) were calculated and Wilcoxon Rank-Sum tests performed for different endophenotypes, before and after controlling for age and BMI.

**Results:** Rs1421085 and rs9939609 have ORs of 1.31 and 1.28, respectively. In view of the high linkage disequilibrium between these SNPs, only the variant with the most significant OR, rs1421085, was tested for association with obesity parameters in patients. We found significant associations for weight ( $p = 0.017$ ), BMI ( $p = 0.003$ ), fat mass ( $p = 0.013$ ), TFA ( $p = 0.027$ ) and SFA ( $p = 0.014$ ). After adjusting for age and BMI, only the association with BMI remained significant ( $p = 0.002$ , adjusted for age).

**Conclusion:** Both FTO SNPs are associated with obesity, enabling us to replicate earlier findings from Caucasian cohorts in a Belgian population sample. Subcutaneous fat seems to contribute to the obesity phenotype in our population.

**Funding:** Research relating to this abstract was funded by Johnson & Johnson Pharmaceutical Research and Development.

## T1:PS.170

**The effects of oleylethanolamide on feeding behaviour involve hypothalamic oxytocin neurons.**

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Oleylethanolamide (OEA) is the monounsaturated analogue of the endocannabinoid anandamide. Differently from anandamide, which causes overeating and stimulate lipogenesis by activating CB1 receptors, OEA decreases food intake and body weight gain in rats and mice through a cannabinoid receptor-independent mechanism. The effects of OEA on feeding are behaviourally selective and are due to the prolongation of feeding latency and post meal interval. A large body of evidence indicate that they are mediated by the activation of peripheral PPAR-alpha receptors, but the central mechanisms downstream to this activation that are still unclear.

Data obtained mapping brain c-fos mRNA levels revealed that the systemic administration of OEA evokes highly localized increase of c-fos transcription in the nucleus of the solitary tract (which is in accordance with the peripheral action of OEA), the paraventricular nucleus (PVN) and the supraoptic nucleus (SO). The magnocellular components of both nuclei release oxytocin, one of the anorectic hypothalamic neuropeptides. During feeding, magnocellular oxytocin neurons, especially those in the SO, become strongly activated indicating their imminent role in meal termination. We hypothesized that oxytocin neurons, might play a key role in regulating energy intake after OEA administration.

In agreement with our hypothesis, we found that OEA enhances the gene expression of oxytocin in both areas and that its anorexic action can be prevented by pretreatment with a selective oxytocin receptor antagonist. Our data suggest that oxytocin release in the PVN and SO nuclei may be responsible for the mediation of the effects induced by OEA on feeding.

## T1:PS.172

**Do overweight subjects show consistency on *ad libitum* food consumption and self-reported food intake in laboratory intervention studies? Effect of a protein-containing liquid preload on voluntary food intake at a subsequent meal**

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**Background:** Recent studies indicate that certain types of milk protein (eg whey) may be more satiating than others (eg Casein). However, most studies on this topic have been carried out in normal-weight individuals and their replication might not be feasible in overweight/obese subjects.

**Methods:** Six healthy men and two women, BMI 27-32 kg/m<sup>2</sup>, aged 18-45 yrs, not dieting and weight-stable during the previous three months were studied. Women were studied during the first phase of their menstrual cycle. The day of the study participants consumed a standardized breakfast providing 10% of their daily energy requirements. In a randomized cross-over design, 150 minutes after breakfast, participants consumed either a 250 kcal (40% of energy from whey-protein) or a control non-energy flavoured liquid preload (400 ml), with each being repeated on two occasions. Ninety minutes later, *ad libitum* food intake was assessed at lunch. Visual analogue scales for subjective appetite were scored every 30 minutes. Food intake during the remaining of the day was also reported. Treatments were repeated within a week to assess consistency of results.

**Results:** Eating at lunch and during the remainder of the day was consistent for the repeated exposure of each arm of the study. Energy intake at lunchtime was 115 kcals lower after whey-protein, representing 46% of the preload energy content. No significant differences in appetite ratings were observed between treatments.

**Conclusions:** Our results in overweight/obese subjects participating in a laboratory study showed consistency in *ad libitum* and self-reported food intake.

**Funding:** Research relating to this abstract was funded by Mars UK.

## T1:PS.171

**Variation in postprandial peptide YY<sub>3-36</sub> status following ingestion of high carbohydrate, high fat and high protein meals in obese females**

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**Aim:** This study investigates the effect of macronutrient composition of meals on postprandial peptide YY<sub>3-36</sub> (PYY<sub>3-36</sub>) response, in obese hyperinsulinemic females.

**Methods:** Eight obese females consumed three iso-energetic meals of different macronutrient composition, a high carbohydrate (HC) (60% CHO, 20% protein, 20% fat), a high fat (HF) (30% CHO, 20% protein, 50% fat) and a high protein (HP) (30% CHO, 50% protein, 20% fat), on three separate occasions, 1 month apart. PYY<sub>3-36</sub>, insulin and glucose were measured before, and 15, 30, 60, 120 and 180min following each meal.

**Results:** PYY<sub>3-36</sub> levels increased significantly following the three meals with the HC meal resulting in a sustained postprandial increase in PYY level throughout the experimental period. Comparing the three meals, the HF meal induced a significantly higher increase in postprandial PYY<sub>3-36</sub> levels, at 15 and 30min as compared to the HP (p <0.05). whereas the postprandial increase following the HP meal became significantly higher than that of the HF meal at 120min. Postprandial increase in PYY was highest in the first hour following the HF meal, while that of HP meal was delayed by one hour.

**Conclusion:** Increasing both protein and fat content of a meal may induce an immediate and prolonged increase in PYY<sub>3-36</sub>, resulting in increased satiety and its maintenance for a longer period of time.

**Acknowledgment:** This study was supported by the Lebanese National Council for Scientific Research and the University Research Board of the American University of Beirut, Lebanon.

## T1:PS.173

**Baseline leptin levels affect the response of leptin to 6 months of aerobic exercise training.**

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There is inconsistency regarding whether aerobic exercise training (ET) causes a reduction in leptin in weight stable humans. We speculate this may be due to the variability of leptin levels within the studied populations. The purpose of this study was to examine whether baseline leptin levels affect the response of leptin to ET

Ninety seven previously sedentary individuals underwent a 6 month progressive and supervised ET program (60-85% VO<sub>2</sub>max, 45 minutes per day, 4 days per week). Blood was sampled for the measurement of leptin prior to ET, 24 and 48 hours after completion of the final ET session. All participants were instructed to maintain normal eating habits in order to maintain weight.

ET resulted in a small reduction in body mass (80.47 ± 18.03 vs 79.42 ± 17.34kg, p<0.01). Leptin was reduced 24 hours post, but returned to baseline values 72 hours post (Pre: 13.51 ± 12.27, 24hr: 12.14 ± 12.34, 72hr: 12.98 ± 11.40 ng/ml).

We compared the lowest 10% (n=9) of baseline leptin to the highest 10% (n=9). There was a significant time X baseline leptin interaction whereby the highest 10% did not follow the typical pattern of increasing leptin between 24 to 72 hour post-training. We expanded the subpopulation to the lowest (n=24) and highest quartiles (n=24) of baseline leptin. Despite the larger sample size the time X baseline leptin interaction disappeared. These data suggest that ET is successful in reducing leptin levels only in those whose baseline levels are the highest.

## T1:PS.174

**Effect of trans-10,cis-12 conjugated linoleic acid on hepatic expression and activity of oxidative enzymes and triacylglycerol content in hamsters fed an energy restricted diet.**

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Insulin sensitivity can be partitioned into basal (hepatic) and peripheral (muscle, adipose tissues) sensitivity. Adipocytokines are important fat mediators for glucose homeostasis in insulin-resistant subjects. However, relationships of abdominal fat with the basal and dynamic components of insulin sensitivity have not been yet elucidated. **Aim** was the assessment of possible relationships of adiponectin and leptin with these components of insulin sensitivity in overweight type-2 subjects (T2DM) with plurimetabolic syndrome.

**Methods:** T2DM (5F/11M; 59±2 yr; duration=5±1 yr; HbA1c=6.7±0.1%; BMI=29.5±1.1 kg/m<sup>2</sup>; waist=104±2 cm; basal glucose=134±5 mg/dl; basal insulin=9.4±1.2 µU/ml; uric acid=5.3±0.3 mg/dl) and 16 matched overweight controls (CTN) underwent a 75g-2h OGTT. Lipid profile was (mg/dl): cholesterol=204±8, HDL=53±3, LDL=119±8, triglycerides(TG)=168±27. Abdominal fat was determined as cardiovascular risk factor LAP [lipid overaccumulation=(waist-k)×TG; k=gender constant]. Basal insulin sensitivity was measured with QUICKI index and the peripheral one with OGIS.

**Results:** LAP was 66±8 cm×mm/L. T2DM and CNT adiponectin (7.4±0.5, 7.8±0.9 µg/ml), leptin (13±3, 13.3 ng/ml) and QUICKI (0.39±0.01, 0.39±0.01) were not different (p>0.2); OGIS (317±11, 406±12.6 ml min<sup>-1</sup>m<sup>2</sup>) was lower in T2DM, p=0.0001. LAP inversely correlated with OGIS (R=-0.57, p=0.026) and QUICKI (R=-0.56, p=0.022) only in T2DM. Cytokines were normalized to BMI (adiponectin=0.25±0.02; leptin=0.42±0.08). Leptin inversely correlated with QUICKI (R=-0.45, p=0.009), adiponectin directly with OGIS (R=0.43, p=0.015), in all subjects.

**Conclusions:** Lipid overaccumulation plays a major role in insulin sensitivity impairment. Adipocytokines mediate insulin resistance, but have different sites of action: adiponectin operates at peripheral tissues level; leptin is active mainly on fasting (liver) sensitivity and is not relevant in diabetic state.

## T1:PS.176

**Altered eating behaviours in adult rats prone to Dietary Induced Obesity (DIO)**

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Altered eating patterns and a shift toward night consumption has been reported in obesity. We questioned whether animals susceptible to DIO modify their eating behaviours. Adult Sprague-Dawley rats (n=29) were randomly given, ad libitum, high-fat (canola-oil or butter) diets or chow for 50d, followed by low fat diet for 28d and 40% energy restriction for 32d. By day 28, only rats (n=4) in the butter-fed group were categorized, based on excessive obesity index, as DIO-prone. Their behaviour differed from other rats: when switched from chow to high fat diets, they ate the same volume of food and increased their energy intake (61±4 to 99±4 kcal/d, P=0.001), and weighed more (P =0.027) than other high-fat fed rats by day 50; by contrast, canola-fed animals decreased food volume to maintain energy intake. DIO-prone rats had higher weight at baseline (P=0.044) than other groups, and greater abdominal fat volume and leptin levels (P <0.04) than other restricted animals after weight loss. During high-fat diets, DIO-prone ate comparable amounts of calories during light and dark cycles; during energy restriction, they kept food for later contrary to other food-restricted rats. In conclusion, DIO-prone animals develop obesity by failing to compensate for the increase in energy density, only when given a palatable diet, and eating more at inappropriate times; adjustment to diets reduced in energy density is also altered. These behaviours support the known associations between high fat diets and prevalence of obesity in humans and the therapeutic potential for low fat diets to induce weight loss.

## T1:PS.175

**Association of angiotensin-converting enzyme dd genotype with diminished thermogenesis in response to acute cold exposure in healthy children**

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**Introduction:** The adipose tissue renin-angiotensin system (ARAS) contributes to regulation of fat mass and may also impact on energy metabolism. We previously reported that an insertion/deletion (I/D) polymorphism of angiotensin-converting enzyme (ACE) gene affected the activity of autonomic nervous system (ANS) in healthy young females. In this study, we therefore examined whether or not the ACE I/D polymorphism was associated with cold-induced thermogenesis in healthy children.

**Subjects and methods:** Twenty-two children (6-11yrs) were genotyped for I/D polymorphism of the ACE gene by applying a PCR-restriction fragment length using buccal samples. Resting energy expenditure was measured by indirect calorimetry for 30 min under thermoneutral (25°C) or cold conditions (10°C) in an environmental chamber. The activity of ANS was assessed by power spectral analysis of heart rate variability (HRV). Samples of saliva were collected for cortisol determination at the end of experimental session. Each experiment was performed on 2 consecutive days.

**Results:** During cold exposure, total power of the HRV, an index of overall ANS activity, as well as the salivary cortisol concentration significantly increased in the children with wild-type (II) and heterozygous alleles (ID) (II+ID, n=16); while no response was observed in the carriers of homozygous (DD, n=6). Moreover, the DD group showed a significantly lower thermogenesis compared to the II+ID group.

**Conclusion:** Despite cold-induced sympathetic stimulation, the DD genotype had lower thermogenesis potentially through reduced activity of the sympathetic system, supporting the possibility that ACE DD genotype may be one of the genetic markers for future pathogenesis of obesity.

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## T1:PS.177

**Nutritional status, chronic noncommunicable diseases and lifestyle of Croatian adults as determined by an on-line questionnaire**

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There is a tight connection between nutrition and health. Most of increased body mass and obesity problems, one third of all cardiovascular diseases and about 40% of malign diseases could be prevented by changes in nutritional habits and increased physical activity. The aim of this research was to evaluate nutritional status (on the basis of BMI), prevalence of chronic noncommunicable diseases, basic dietary habits, and physical activity of adults according gender (485 male, 2500 female). On line questionnaire was placed on a web pages of Podravka, one of the biggest food industries in Croatia, www.coolinarika.com. According the self reported mass and height and BMI calculated, 55% of participants had normal weight, while 42% of participants showed increased body mass. Among men, overweight and obesity were more common, while among women underweight and normal weight were more dominant. 15% of all participants were suffering of chronic noncommunicable diseases, men a bit more than women. The most common diseases encompass hypertension, heart diseases, diabetes, food allergies and thyroid gland problems. Most of the participants were occupied by sedentary activities 2-5 hours a day, and again with higher prevalence among men than among women. In conclusion, our results showed that women more often respect dietary recommendations, often eat breakfast and light meals, take more care of the foods choice, have lower BMI and lower incidence of the chronic noncommunicable diseases.

## T1:PS.178

**Absence of *inos* increases energy expenditure in *ob/ob* mice through an upregulation in *PGC1-α* expression**Becerril, S<sup>1,3</sup>, Gómez-Ambrosi, J<sup>1,3</sup>, Rodríguez, A<sup>1,3</sup>, Catalán, V<sup>1,3</sup>, Frühbeck, G<sup>1,2</sup><sup>1</sup>Metabolic Research Laboratory, and <sup>2</sup>Department of Endocrinology, Clínica Universitaria de Navarra, Pamplona, and <sup>3</sup>CIBER Fisiopatología de la Obesidad y Nutrición, Instituto de Salud Carlos III, Spain.**Background:** Leptin mediates several physiological processes through the activation of inducible nitric oxide synthase (iNOS). The aim of the present study was to evaluate the absence of the iNOS gene on energy homeostasis in genetically obese *ob/ob* mice.**Methods:** A double knockout (DBKO) mouse model lacking simultaneously the *ob* and *iNOS* genes was generated by intercrossing *ob/ob* mice with iNOS knockout mice (iNOS<sup>-/-</sup>). Male mice were fed a normal chow diet for 12 weeks. Body weight, food intake and body temperature were periodically registered. Serum free fatty acids (FFA) were measured and mRNA expression of *Pgc1-α* was analysed by Real-Time PCR.**Results:** Body weight was significantly lower in iNOS<sup>-/-</sup> mice as compared with wild type counterparts (26.1±0.3 vs 24.9±0.4 g, *P*<0.05), in spite of not showing differences in food intake. The reduction in body weight was accompanied by decreased epididymal fat pads (0.64±0.03 vs 0.49±0.02 g/100g body weight, *P*<0.05). Energy expenditure in iNOS<sup>-/-</sup> mice was significantly higher than that of wild type mice as evidenced by rectal temperature (37.8±0.1 vs 38.5±0.2 °C, *P*<0.05). Furthermore, *Pgc1-α* expression was two-fold upregulated compared to WT mice (1.00±0.66 vs 2.23±1.06, *P*<0.05). Food intake of DBKO mice was similar to that of *ob/ob* mice, but they exhibited a decreased body weight (47.3±0.9 vs 45.0±0.7g, *P*<0.05), increased rectal temperature (36.3±0.2 vs 37.1±0.1 °C, *P*<0.05), decreased levels of FFA (1.19±0.15 vs 0.81±0.04, *P*<0.05) and an increased *Pgc1-α* mRNA expression (0.67±0.28 vs 1.17±0.50, *P*<0.05) as compared to *ob/ob* mice.**Conclusion:** Lack of iNOS improved the reduced energy expenditure of *ob/ob* mice. This fact might be related to an increase in fatty acid oxidation induced by increasing *Pgc1-α* expression.**Funding:** Supported by SAF2003-09225 and PIUNA 2005-20

## T1:PS.180

**Genetic polymorphisms of the renin-angiotensin system and obesity-related metabolic changes in response to calorie restriction therapy in obese women**Hamada T<sup>1</sup>, Kotani K<sup>2</sup>, Sano Y<sup>1</sup>, Nagai N<sup>3</sup>, Moritani T<sup>1</sup>, Kiso S Sakane N<sup>4</sup><sup>1</sup>Division of Preventive Medicine, National Hospital Organization Kyoto Medical Center<sup>2</sup> Division of Health Administration and Promotion, Tottori University<sup>3</sup> Faculty of Health and Welfare, Okayama Prefectural University<sup>4</sup> Graduate School of Human & Environmental Studies, Kyoto University<sup>5</sup> Institute for Health Care Science, SUNTORY Ltd.Several genetic polymorphisms of the renin-angiotensin system (RAS) have been implicated risk factors for hypertension and cardiovascular disease. The polymorphic effects of the RAS (insertion/deletion of ACE gene and A1675G of AT2R gene) on blood pressure (BP) and obesity-related metabolic changes in response to weight loss induced by low-calorie diet (LCD) with meal replacement drinks (diet's®s, SUNTORY Ltd.) were investigated in 32 obese women (age 49.9 ± 8.4 yrs). Clinical, metabolic and biochemical profiles were measured before and after a 2-month intervention of LCD. RAS gene polymorphisms were determined with a fluorescence-based allele-specific DNA primer assay system. Although weight reduction and nutrient intake did not differ among the genotypes, subjects with the ACE D/D genotype and the AGTR2 G/G genotype remained unchanged systolic and diastolic BP, insulin, LDL- and HDL-cholesterol levels, triglyceride, and whole body fat oxidation. Importantly, the AGTR2 G/G genotype showed significantly less improvement of systolic BP (2.5 ± 5.0 vs. -7.2 ± 8.5mmHg, *P*<0.01), LDL-cholesterol levels (-3.5 ± 9.8 vs. -13.6 ± 11.6mg/dl, *P*<0.05), and whole body fat oxidation (0.1 ± 9.9 vs. 8.3 ± 11.9mg/min, *P*<0.05) than other AGTR2 genotypes. Furthermore, reduction in body fat after weight loss was significantly less in ACE D/D genotype than in other ACE genotype (-0.8 ± 1.6 vs. -2.3 ± 1.4%, *P*<0.001). These findings suggest that the homozygous form of the ACE and AGTR2 gene could be a polymorphic marker predicting difficulty in improving BP and obesity-related metabolic profiles following a LCD to induce weight loss in obese women

## T1:PS.179

**Effect of an increase in dairy intake on weight maintenance in individuals with a low habitual calcium intake**de Jonge, L<sup>1</sup>, Most, MM<sup>1</sup>, Rood JC<sup>1</sup>, Burton M<sup>1</sup><sup>1</sup> Pennington Biomedical Research Center, LSU system, Baton Rouge LA, USA**Introduction:** It has been suggested that Ca plays a role in weight maintenance. Animal studies have shown that increased Ca intake led to a smaller increase in body weight and a decrease in body fat. An increase in core temperature was also observed. Epidemiological data have suggested a role for Ca in body weight regulation but whether the mechanisms shown in mice, apply in humans is unknown.**Aim:** To determine the effect of Ca supplementation in men with a low habitual Ca intake on body weight, 24H energy expenditure (24H EE), fat oxidation (FatOx) and satiety.**Methods:** Nine healthy overweight males consuming <400mg Ca/day participated in this study. 24H EE and FatOx were measured in a room calorimeter at baseline (Wk0) and after 4 weeks of consuming 3 servings of dairy/day (Wk4). Hunger and satiety were measured hourly between 08:00 and 22:00 using VAS scales.**Results:** Body weight and %body fat did not significantly change (-0.6±1.8kg and -0.6±1.1%, respectively) after 4 weeks of dairy supplementation. There was also no change in 24H EE (2632±154 vs 2649±123kcal/24H), Sleep EE or FatOx (98.3±22.3 vs 89.6±18.9g/24H). However, there was a significant increase in exercise EE (4.4±0.2 vs 4.8±0.1kcal/min) and a decrease in all hunger scores.**Conclusions:** The results suggest that an increase in dairy consumption over 4 weeks does not affect 24H EE or substrate oxidation. However, since an increase in exercise EE and a decrease in hunger was observed, dairy consumption might play a role in weight maintenance over a longer period.

## T1:PS.181

**The energetic and cardiovascular response to walking and cycling in obese women**Lafortuna CL<sup>1</sup>, Agosti F<sup>2</sup>, Galli R<sup>2</sup>, Busti C<sup>2</sup>, Lazzar S<sup>4</sup>, Sartorio A<sup>2,3</sup><sup>1</sup>Istituto di Bioimmagini e Fisiologia Molecolare del Consiglio Nazionale delle Ricerche, Segrate, Milano, Italy; <sup>2</sup>Laboratorio Sperimentale di Ricerche Auxe-Endocrinologiche, Istituto Auxologico Italiano, IRCCS, Milano, Italy; <sup>3</sup>Divisione di Malattie Metaboliche III, Ospedale S.Giuseppe, Istituto Auxologico Italiano, IRCCS, Piancavallo, Verbania, Italy; <sup>4</sup>Sezione di Fisiologia Umana, Dipartimento di Scienze e Tecnologie Biomediche, Università degli Studi di Udine, Italy.Physical activity has a main role in obesity management, but exercise capacity is compromised in obese individuals due to excess of mass altering energetics of movements and to dysfunctions of regulatory mechanisms affecting cardiovascular responses. To compare the energetics of walking and cycling, and the related cardiovascular responses in obese individuals, in order to define the exercise modality most sustainable and effective for obesity rehabilitation and weight loss programs, 15 obese (OB) and 6 normal weight (NW) women exercised on treadmill (TM) and cycle ergometer (CE) while gas exchange, heart rate (HR) and metabolic rate (E) were determined. Net cost of transport (NCOT) was calculated for walking and mechanical efficiency (ME) for cycling. During walking, net E was 2.2-2.3 fold higher in OB than in NW (*p*<0.001), as well as net E/(body mass, BM) and NCOT (*p*<0.05), which correlated with BM (*p*<0.001-0.01). During cycling, net E was significantly (*p*<0.01-0.001) higher in OB than in NW (about +23%) and correlated with BMI (*p*<0.001). Net leg movement E depended from BMI and, when accounted for, no difference in cycling E between groups remained. While net ME was significantly lower in OB (*p*<0.001), work ME was similar for OB and NW (*p*=0.193). In both groups, HR was higher during CE than TM at the same oxygen uptake (VO<sub>2</sub>), but in OB the HR increment over VO<sub>2</sub> was greater for CE than for TM (*p*<0.001). Due to body mass mechanics, TM locomotion in given conditions is much more costly for OB than NW. When accounting for extra mass, differences in E among groups are abolished for CE, indicating no obesity derangement of muscle efficiency, but not for TM, suggesting that differences in biomechanics may explain the higher E/BM and NCOT of OB. Nonetheless, due to different cardiovascular responses to TM and CE in OB, walking is more convenient, enabling OB to attain target energy expenditure at lower HR, or in shorter time.

	Baseline	After weight loss	5 year follow - up
TNF-α (pg/ml)	7.1 ± 2.3	5.5 ± 1.7 **	5.7 ± 2.1 <sup>†</sup>
sTNFR1 (pg/ml)	1256.9 ± 234.0	1425.2 ± 323.0**	2061.2 ± 507.7 <sup>†††††</sup>
sTNFR2 (pg/ml)	1729.4 ± 421.2	2066.3 ± 339.1**	2120.0 ± 418.4 <sup>†††††</sup>
IL-6 (pg/ml)	10.9 ± 4.6	8.8 ± 2.3**	7.9 ± 3.5 <sup>††††</sup>

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## T1:PS.182

## Weight loss, weight gain and chronic inflammation

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**Objective:** The aim of the study was to determine the prospective changes of proinflammatory cytokines concentrations in obese women in relation to weight changes during 5-year observation.

**Material and methods:** 30 obese women without concomitant diseases (n = 68, age 53.4.0 ± 8.4 y, BMI: 38.9 ± 5.6 kg/m<sup>2</sup>) were subjected to the complex weight reduction therapy. Serum concentrations of TNF- $\alpha$ , sTNFRs, NO and IL-6 were measured by ELISA method at the beginning of observation, after three months of complex weight therapy and after 5 years.

**Results:** Three-month weight reduction therapy led to mean weight loss 7.9 ± 4.4 kg. After 5 years 7.6 ± 6.6 weight gain was observed. No changes of TNF and IL-6 levels were detected after weight gain. It is interesting observation that serum concentrations of sTNFRs increased after both weight loss and gain.

	Baseline	After weight loss	5 year follow – up
TNF- $\alpha$ (pg/ml)	7.1 ± 2.3	5.5 ± 1.7 **	5.7 ± 2.1 <sup>†</sup>
sTNFR1 (pg/ml)	256.9 ± 234.0	425.2 ± 323.0**	2061.2 ± 507.7 <sup>†††††</sup>
sTNFR2 (pg/ml)	729.4 ± 421.2	066.3 ± 339.1**	2120.0 ± 418.4 <sup>†††††</sup>
IL-6 (pg/ml)	10.9 ± 4.6	8.8 ± 2.3**	7.9 ± 3.5 <sup>†††</sup>

<sup>†</sup> p < 0.05; <sup>†††</sup> p < 0.0001; <sup>\*\*</sup> p < 0.0001; <sup>†††††</sup> p < 0.0001

**Conclusion:** The results of our prospective observation suggest that weight loss causes long-term inhibition of systemic inflammatory activation and subsequent yo-yo effect does not reverse this beneficial effect.

## Track 2 ISC Abstract Selected Posters

## T2:PS.02

## Weight and eating patterns' evolution, 5 years after gastric by-pass.

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Gastric by-pass is the recommended treatment for morbidly obese patients. Published data show 80% success rates at one year, and 50% at 5 years. Data on weight evolution after 5 years are sparse.

Our aims were to measure weight and eating behaviour changes, and to identify factors associated with 50% excess weight loss (EWL)  $\geq$  5 years after gastric by-pass.

Patients who underwent gastric bypass and were followed at the Obesity consultation of University hospitals of Geneva, Switzerland, were included. Of 141 eligible patients, 74 (52%) accepted an appointment during which two dieticians weighed them, investigated eating patterns, anxiety and depression, by means of interviews and questionnaires.

Baseline body mass index was 46 ( $\pm$ 7) kg/m<sup>2</sup>. Mean duration since operation was 7 ( $\pm$ 1.2) years. One year after surgery, all patients had lost weight (mean 36  $\pm$ 12 kg) and 88% experienced  $\geq$ 50% EWL. Between the second and the 7<sup>th</sup> year, 15% lost >5kg, 28% stabilized weight and 57% regained weight: 17% 5 to 9 kg, 29% 10 to 19 kg and 11%  $\geq$  20 kg. Among the 41 patients who regained weight, 19 presented nevertheless 50% EWL. After seven years, 64% presented  $\geq$ 50% EWL, but 51% suffered from binge eating disorder or night eating syndrome. Among women, factors independently associated with 50% EWL were depression (p=0.01), lower energy (p=0.01) and protein intake (p=0.02).

Gastric by-pass has very good results in terms of weight loss more than five years after the operation. Many patients, however, suffer from eating disorders.

## T1:PS.183

## Using individual select elimination diet in Ukraine overweight and obesity patients for treatment and precautions

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**The Aim:** estimate efficacy of correction nutrition by using individual select elimination diet based on results Antigen Leukocyte Cellular Antibody Test (ALCAT)

**Material:** 1150 patients have been included in research (women - 676, men - 474). Middle age - 39 $\pm$ 2,1.

**Methods:** we calculated body-mass index (BMI), quantity of total fat, visceral fat, muscular mass - device OMRON BF 306, BF 500 to all patients, parameters were estimated each months. We corrected nutrition to patients with overweight and obesity based on results of ALCAT - device ROBOCAT II; individual elimination diet was determined for 3 and 6 months.

**Results:** we distributed patients on 3 groups. 374 persons were in the first, BMI did not exceed 25; 517 - in the second, BMI within the limits of 26-30; 259 - in the third, BMI exceeded 30. After 6 months observance elimination diet according ALCAT at 448 patients in the second group BMI did not exceed 25, at 35 was within the limits of 26-28. In 178 patients at the third group BMI was lower 26, and at 44 was within the limits of 26-28.

**Conclusion:** we have been discovered high prevalence of visceral fat among man and high percent of total fat in woman with overweight and obesity; OMRON BF 500 more effective for estimation efficacy of individual select elimination diet in patients. ALCAT is effective method of individual select elimination diet for patients with overweight and obesity in Ukraine which gives proof effect of normalization and stabilization of weight during long time.

## T2:PS.04

## Effect of genotype at TCF7L2 rs7903146 on weight loss: interaction with fat and carbohydrate content of hypo-energetic diet

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**Objectives:** To investigate if TCF7L2 rs7903146 genotypes (CC, CT, TT), of which TT is known to be associated with type 2 diabetes, affects changes in obesity related phenotypes during hypo-energetic diets with different fat- and carbohydrate content.

**Subjects and Methods:** In a 10-week, European, multi-centre dietary intervention study 771 weight stable, obese (BMI  $\geq$ 30 kg/m<sup>2</sup>) men and women were randomised to a high-carbohydrate (20-25 % of energy from fat; 60-65 % of energy from CHO) or high-fat (40-45 %E fat; 40-45 %E carbohydrate), hypo-energetic diet (-600 kcal/day). Of 739 genotyped, 622 completed the intervention with an average weight loss of 6.8 kg.

**Results:** Adjusting for gender, age, centre and baseline value of outcome, we found significant interaction between rs7903146 (recessive effect) and diet in weight loss ( $\Delta$ weight) (P=0.023), loss of fat free mass ( $\Delta$ FFM) (P=0.032), waist circumference ( $\Delta$ WC) (0.023) and decrease in homeostasis model assessed insulin resistance ( $\Delta$ HOMA-IR) (P=0.001), but not in insulin secretion. Changes in obesity related phenotypes were similar for TT on high-CHO diet; and for CC and CT on either diet. In patients randomised to high-fat diet, the TT group  $\Delta$ weight was 2.08 kg (95%-CI: 0.50-3.65),  $\Delta$ FFM 1.3 kg (95%-CI: 0.19-2.42),  $\Delta$ WC 2.4 cm (95%-CI: 0.32-4.47) and  $\Delta$ HOMA-IR 1.26 (95 %-CI: 0.52-2.00) smaller than the CT and CC groups. The genotypes had a similar effect on loss of fat mass, but in an additive model.

**Conclusion:** The TCF7L2 rs7903146 genotype modifies the effect of fat- and carbohydrate content of hypo-energetic diet on changes in obesity related phenotypes.

**Funding:** The NUGENOB project was supported by EU grant QLK1-CT-2000-00618

## T2:PS.05

**Macronutrient specific effect of *FTO* rs9939609 on changes in insulin secretion and resistance following a 10-week dietary weight loss intervention**

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1 Institute of Preventive Medicine, Copenhagen University Hospital, Centre for Health and Society, Copenhagen, Denmark; 2 Nugenob Consortium.

**Objectives:** To examine the joint effects of fat and carbohydrate (CHO) content of hypo energetic diet and genotype at *FTO* rs9939609, repeatedly shown to be strongly associated with obesity, on changes in insulin secretion and resistance measured by HOMA.

**Subjects and Methods:** In a 10-week, European, multi centre dietary intervention study 771 weight stable, obese (BMI  $\geq 30$  kg/m<sup>2</sup>), but otherwise healthy men and women were randomised to a low-fat, high-CHO (20-25 % energy from fat; 60-65 % energy from CHO) or high-fat, low-CHO (40-45 % fat; 40-45 % CHO), hypo-energetic diet (energy deficiency = 600 kcal/day). Of 734 obese subjects who were successfully genotyped for *FTO* rs9939609 619 completed the 10-week weight loss intervention.

**Results:** When adjusting for, gender, age, centre and baseline values of insulin secretion and resistance respectively there were statistically significant interactions between genotype at *FTO* rs9939609 and fat and CHO content in relation to changes in insulin secretion (P for interaction = 0.009) and resistance (P for interaction = 0.047). Decrease in insulin secretion and resistance was greater in subjects homozygous for the T allele who were randomised to the low fat diet than for subjects with the same genotype but randomised to the high fat diet and was also greater than for carriers of the A allele regardless of diet.

**Conclusion:** Fat- and carbohydrate content of hypo-energetic diet influences decrease in insulin secretion and resistance due to interactions with the *FTO* gene (homozygosity for the T allele of rs9939609).

**Funding:** The Nugenob project was supported by EU grant QLK1-CT-2000-00618

## T2:PS.08

**True “slow carbs” have minor effects on appetite: effects of pullulan chain length on appetite and plasma glucose and insulin**

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**Background:** Effects of reduced or more sustained postprandial glucose rises on appetite are inconsistent, perhaps due to lower energy availability of the carbohydrates tested. A true “slow carb” is completely digested in the small intestine but at a slower rate. We compared effects of a true “slow carb” versus rapidly digestible carbohydrates on glucose, insulin and appetite responses.

**Methods:** In a 4-way fully randomised double-blind crossover design 35 normal weight volunteers received Slim.Fast meal replacement drinks with 15 g maltodextrin (control), or with maltodextrin replaced by 15g long-, medium- or short-chain Pullulan (LCP, MCP, SCP: 200, 23 and 10 kDalton, respectively). Appetite scores (6 line scales), digestibility (breath hydrogen) and (in an n=12 subset) blood glucose and insulin levels were measured for 5 hours. All parameters were analyzed using ANOVA and baseline values as covariates.

**Results:** 77, 89, and 23% of SCP, MCP and LCP, respectively was digested in the small intestine, and at a slower rate than control. Breath hydrogen data confirmed the same pattern. Consistent with this, LCP produced the lowest, and control the highest blood glucose and insulin excursions, with MCP and SCP showing intermediate and more sustained patterns. All appetite scores were significantly improved after LCP versus control, while after MCP it was significantly improved for “satiety” only. All differences were apparent during the first 150 min.

**Discussion:** MCP provided more available energy than the largely indigestible LCP, and can be regarded as a true “slow carb”. However, LCP had the most consistent effects on appetite. We conclude that more modest rises in glucose have minimal effects on appetite, when tested in products only differing in carbohydrate digestibility rate and extent.

**Conflict of Interest/Funding:** all authors are Unilever employees. All research relating to this abstract was funded by the Unilever Food & Health Research Institute

## T2:PS.07

**Cost-effectiveness of surgically induced weight loss for the management of type-2 diabetes: randomised trial**

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**Context:** Obesity is a major risk factor for type-2 diabetes. The high disease and cost burden associated with diabetes is well documented.

**Objective:** To determine whether surgical therapy is more cost-effective than conventional therapy for achieving remission of type-2 diabetes in obese patients.

**Methods:** Effectiveness results were derived from a two-year Australian randomised controlled trial which demonstrated that obese patients (BMI:30-40kg/m<sup>2</sup>) receiving surgical therapy (laparoscopic adjustable gastric banding) achieve greater remission of type-2 diabetes (22/30) than patients receiving conventional diabetes therapy (4/30). A healthcare perspective (comprising direct healthcare costs to government, private insurers and patients) was adopted. Pathway analysis was undertaken to identify within-trial intervention costs (including LAGB surgery, mitigation of complications, outpatient medical consultations, pathology, medical investigations and medication). Resource use was measured from a patient database and medical records, and valued based on private hospital costs in 2006 Australian dollars. Costs and outcomes were discounted at 3%. A “no intervention” comparator (assuming no costs or outcomes) was also assessed.

**Results:** Average two-year per patient intervention costs were surgical: \$AUD13,272 and conventional therapy: \$AUD3,274, with LAGB surgery accounting for 85% of the difference. Outpatient medical consultations costs were three-fold higher amongst surgical patients and medication costs three-fold higher for conventional patients. Compared to no intervention, the incremental cost-effectiveness ratio (ICER) for conventional therapy was \$25,104 per case of diabetes remitted. Compared to conventional therapy, the ICER for surgical therapy was \$16,993 per diabetes case remitted.

**Conclusion:** Over the trial period, surgical therapy was more cost-effective than conventional therapy in remitting diabetes in obese patients.

**Conflict of Interest:** John Dixon – unrestricted research grant from Allergan Health.

Paul O'Brien – unrestricted research grant from Allergan Health.

**Funding:** We acknowledge that this study was funded by Monash University with support from Allergan Health. Allergan Health provides the University with an unrestricted research grant for conducting obesity related research.

Anna Peeters is funded by a VicHealth Research Fellowship.

## T2:PS.09

**Effects of Taranabant, a Novel Cannabinoid 1 Receptor (CB-1R) Inverse Agonist, on Weight Reduction in Obese Patients Over 12 Weeks**

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**Objectives:** Assess the short-term efficacy and safety of taranabant.

**Methods:** After a 2-wk single-blind placebo (Pbo) plus diet (500 kcal/d deficit) run-in period, patients (body mass index [BMI]  $\geq 30$  and  $\leq 43$  kg/m<sup>2</sup>) were randomized equally to Pbo or taranabant (0.5, 2, 4, or 6 mg) for 12 wks.

**Results:** Taranabant significantly reduced body weight and waist circumference compared to Pbo (Table). The most common AEs were gastrointestinal (GI)-related occurring in 40 (38.1%), 41 (38.7%), 48 (44.0%), 64 (61.0%), and 58 (53.7%) patients in the Pbo, taranabant 0.5, 2, 4, and 6 mg groups, respectively (p<0.001 Pbo through taranabant 4 mg). A total of 19 (18.1%), 22 (20.8%), 30 (27.5%), 33 (31.3%), and 30 (27.8%) psychiatric AEs were observed in the Pbo, taranabant 0.5, 2, 4, and 6 mg groups, respectively (p<0.050 Pbo through taranabant 4 mg). The GI and psychiatric AEs were generally mild in intensity.

**Conclusions:** Taranabant was generally well tolerated and led to significant weight loss in obese patients.

Table. Least Squares Mean Change (95% CI) from Baseline to Wk 12

	Placebo (N=105)	Taranabant			
		0.5 mg (N=106)	2 mg (N=109)	4 mg (N=105)	6 mg (N=108)
Body weight (kg)	1.3 (-1.9, 0.6)	-2.8 (-3.5, -2.2)***	-3.7 (-4.3, -3.0)***	-4.2 (-4.8, -3.6)***	-5.3 (-5.9, -4.6)***
Waist circumference (cm)	-2.4 (-3.6, -1.3)	-4.2 (-5.4, -3.1)*	-4.2 (-5.4, -3.0)*	-4.8 (-5.9, -3.7)**	-5.0 (-6.1, -3.9)**

\*\*\*p<0.001 for Pbo through the taranabant dose shown; \*\*p<0.010 for Pbo through the taranabant dose shown; \*p<0.050 Pbo through the taranabant dose shown. Research relating to this abstract was funded by Merck & Co., Inc.

## T2:PS.10

## The effects of tesofensine on body composition in obese subjects

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**Background:** Tesofensine (TE) is an inhibitor of the presynaptic uptake of noradrenaline, dopamine and serotonin, important for appetite and energy balance.

**Objective:** To evaluate the effect of TE on body composition.

**Design:** This randomized, double-blind, placebo-controlled, Danish multi-centre, phase IIb trial assessed the efficacy and safety of TE in healthy obese subjects. After a 2 week diet and exercise lead-in period 203 obese men and women (ITT population), 18-65 yrs of age and with a BMI of 30-40 kg/m<sup>2</sup>, were randomized to 0.25, 0.5 or 1.0 mg of TE or corresponding placebo once daily for 24 weeks. Body composition was assessed by DEXA, waist circumference and sagittal diameter.

**Results:** Body weight loss was 2.3±5.2% in the placebo group compared to 6.8±5.9, 11.4±6.3, and 12.7±5.3% with increasing TE dose. Sagittal diameter decreased with 0.6±1.9, 2.1±1.9, 3.3±2.0 and 3.5±1.8 cm, while waist circumference decreased by 3.0±5.7, 6.4±6.2, 9.8±6.0 and 9.8±5.5 cm after placebo, 0.25, 0.5 and 1.0 mg of TE respectively. According to the DEXA scans the corresponding changes in fat mass were -2.8±4.4, -5.7±4.6, -9.2±4.6 and -10.1±4.8 kg, accounting for 108, 85, 81 and 79% of total weight loss.

**Discussion and conclusion:** Compared to placebo 0.5 and 1.0 mg TE resulted in weight reduction twice that produced by currently approved obesity drugs, of which ~80% could be accounted for by a reduction in fat mass. The concomitant decrease seen in sagittal diameter and waist circumference therefore indicates that TE is highly effective in reducing central obesity.

**Conflict of interest:** A Astrup has received honoraria as a consultant for Neurosearch A/S and as a member of their tesofensine obesity advisory board and owns 400 Neurosearch shares. TM Larsen has received a speaker's honorarium from Neurosearch A/S.

DH Meier and BO Mikkelsen are employed by NeuroSearch A/S, Denmark. TJ Jensen owns 40 Neurosearch shares.

**Funding:** Research related to this study was funded by NeuroSearch A/S, Denmark.

## T2:PS.12

## Multilayer neural perceptrons (MNP) multivariate analysis of MMPI-2 scores in the outcome prediction of adjustable gastric banding (AGB)

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Adjustable gastric banding (AGB) is performed to produce a stable body weight reduction in severely obese subjects. The success of the procedure is highly dependent upon patient adherence to permanent dietary restriction and long term follow-up visits. In this study presurgical psychological and psychopathological characteristics were analyzed to predict the outcome of AGB in obese women. 125 females (mean age 41.2±11.7 yr, preoperative BMI 42.6±5.4 and postoperative BMI 31.9±4.5) were administered the Minnesota Multiphasic Personality Inventory-2 (MMPI-2) before surgery. Patients with alcohol abuse or taking psychoactive drugs were excluded. A statistical analysis was applied via a multiple regression analysis, with Excess Weight Loss at 24 months follow up (EWL24) as a dependent variable associated with scores of clinical and content scales of MMPI-2. Using a stepwise algorithm by backward elimination, only the independent variables Hypochondriasis, Fears, Type A, Low Self-Esteem and Work Interference were within the confidence interval of 95% with a R=0.47. To improve the goodness of fit, a nonlinear multivariate analysis, based on MNP, was then considered: R increased up to the value of 0.62.

A clustering analysis was then performed to divide patients into quartiles according to the score obtained by the MNP analysis of the selected variables of MMPI-2. The mean ± SEM EWL24 was 35.3±2.5 in the first quartile and it was 65.3±2.8 in the fourth one.

In conclusion, MMPI-2 scores processed by a non linear multivariate analysis based on MNP can be helpfully employed to predict the surgical outcome of AGB in obese women.

## T2:PS.11

## The effects of gas-filled liquid foods on appetite

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**Background:** Increasing food volume with air or water can increase satiety and decrease subsequent food intake. We examined the effects of gas-filled version of a liquid food, prepared using advanced interfacial design technologies, on measures of hunger and satiety over 4 hours, with foods eaten as a single large serving or 2 half-servings.

**Method:** In a randomised crossover trial, 24 subjects (age 42±9 y; BMI 26.2±2.4 kg/m<sup>2</sup>) received isocaloric amounts of a standard or gas-filled version of a liquid meal, varying in volume and/or frequency of ingestion: (A) full volume liquid meal (325 ml, 190 kcal) at 0 min, (B) gas-filled full volume liquid meal (1000 ml, 190 kcal) at 0 min, (C) half volume of treatment (A) (162.5 ml, 95 kcal) at 0 and 120 min, (D) half volume of treatment (B) (500 ml, 95 kcal) at 0 and 120 min. Appetite ratings were measured for 240 min.

**Results:** Both the full- and half-size gas-filled versions of the liquid meal significantly reduced measures of appetite vs. the respective standard liquid meals. Despite 50% less energy, the gas-filled half-volume meal also reduced appetite vs. the full volume standard liquid meal. Increased reports of gastrointestinal complaints were only noted for the full volume gas-filled meal (1000 ml).

**Conclusion:** A gas-filled version of a liquid food, prepared using advanced interfacial design technologies produces a dramatically increased satiety response. This was observed when the food was given as a single large volume at 0 min or 2 half-volumes at 0 and 120 min.

## T2:PS.13

## Morbid obesity in pregnancy

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Obesity is increasingly common in developed countries. Obese pregnant women have increased rates of maternal and neonatal complications, but few studies focus on morbid obesity (BMI>40) in pregnancy.

Our aim was to investigate the incidence of pregnancy related conditions, method of delivery and pregnancy outcomes in morbidly obese pregnant women. We did a retrospective analysis of case notes of patients who booked with BMI > 40 from April 2006 to end March 2007 and compared outcomes with women whose booking BMI was within the range 19 to 25 (2282 women 59% total).

Within this period 59 (1.53%) of all our deliveries [3845] were to women with booking BMI > 40. Of these 59 women, 5 developed hypertensive disease of pregnancy (9.2%, usual incidence 5%), 3 developed obstetric cholestasis (5.8%, published incidence 0.6%) and 4 gestational diabetes (6.7% compared with 3% in rest of obstetric population).

The spontaneous vaginal delivery rate in the morbidly obese group was 47%, and 65.8% in BMI 19-25 group. [p=0.042]

The caesarean section rate was 37 % (elective 14%, emergency 23%) in morbidly obese women and 21.8% [p=0.07] in women with BMI 19-25 (elective 5.8% [p= 0.35] and emergency 16% [p=0.48]).

In the BMI>40 group 25% had meconium liquor, compared to 16.2% in women with BMI 19-25 [p=0.36], and 7 babies (12%) were admitted to special care baby unit.

Morbidly obese pregnant women have high rates of pregnancy related complications including hypertension, obstetric cholestasis and caesarean section. Therefore they need increased surveillance during pregnancy and delivery.

## T2:PS.14

**Diethylpropion evaluation in terms of efficiency, safety and tolerability – A prospective clinical trial.**

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**Introduction:** The first “anorectic drugs” come from the sixties and are still used in many countries. These drugs act mainly reducing food ingestion. Most frequent side effects are related to sympathetic stimulation and psychiatric disorders, but clinical benefits related to weight loss may counterbalance these alterations. Anorectic drugs misuse has been reported due to malpractice and manipulation. There are very few well designed studies in literature to support the clinical use of anorectic agents nowadays.

**Objectives:** The aim of the present study is to evaluate efficiency, safety and tolerability of diethylpropion (DP) in the treatment of obesity.

**Materials and Methods:** Seventy obese patients participated in this two-phase prospective clinical trial. The first phase (0 – 24<sup>th</sup> week) was double-blind with patients randomized to DP 50 mg twice a day (n = 38) or placebo (n = 32). Fifty three patients concluded the 24-week protocol (31 in DP group and 22 in placebo). The second phase (24 – 48<sup>th</sup> week) was open with all patients receiving DP. Thirty three patients concluded the whole study.

**Results:** Significant weight loss was found in diethylpropion group (-10,7%) versus placebo group (-3,1%). There was improvement in the metabolic parameters glucose, insulin, total cholesterol and triglycerides in the treated group (p<0.05). Blood pressure and cardiac rate did not change significantly. The psychiatric status (anxiety and depressive symptoms/disorders) was not altered after DP or placebo.

**Conclusion:** According to our data, diethylpropion promoted a significant weight loss, improved some metabolic parameters and showed a favorable safety profile.

## T2:PS.16

**Weight Loss Follow Up in Overweight Patients: Body Composition Measurements with DXA**

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Clinical evaluation of body fat and lean tissue is recommended when monitoring overweight patients under treatment. The methodology used should be precise, accurate, accessible, and rapid. In this study the clinical utility of body composition assessment with dual-energy x-ray absorptiometry (DXA) in a group of patients treated for obesity is reported.

Fifteen subjects (ten women/five men; age 51±10 years; BMI range 25–42) were followed during obesity treatment for 6 months. Lean body mass (LBM), fat body mass (FBM), and %fat were measured with a Lunar Prodigy DXA (GE Healthcare) at baseline and 6-month follow-up.

Average subject weight decreased from 88,9kg to 79,7kg after six months. Gynoid and android regional %fat values decreased during treatment. Lean mass was also monitored and training schedules were adapted when a significant decrease in lean mass was detected.

We conclude that DXA is a highly useful clinical tool for following patients under treatment for obesity. The Lunar Prodigy provides information on total body and regional fat distribution, lean mass and bone density. Evaluation of regional fat and lean values (e.g. android and gynoid), in addition to total body results, can help the clinician adapt individual diet and treatment programs. DXA body composition offers an accessible technology with very low radiation dose and rapid assessment.

Table 1: Body composition values: baseline and 6-month follow-up

	Baseline	6 Month Follow-up
Average weight (kg)	88.87±14.10	79.74±11.90
Average %fat	41.53±7.66	36.44±8.25
Android %fat	49.51±8.73	42.95±8.97
Gynoid %fat	44.71±8.69	40.39±9.10
Fat-mass (kg)	35.93±8.90	28.40±8.22
Lean-mass (kg)	49.37±10.87	48.12±10.16

## T2:PS.15

**Hyperestrogenism: link between male obesity and depression**

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In male obese occurs aromatase hyperactivity associated with hypogonadotropic hypogonadism. In female obese, depression is frequent. Non-obese depressive men have decreased testosterone compared to non-depressive. And higher estrogen levels and variability are related to less dopamine sensibility and depression in women.

To evaluate relationship between hormones, male obesity and depressive symptoms (DS), we analyzed 43 men with 19-60y of age and body mass index 30-55kg/m<sup>2</sup>. Excluded if severe or psychiatric diseases, low comprehension, hypothyroidism, drugs or ethanol abuse, diabetics.

Three repeated LH (UI/mL) and total testosterone (TT, ng/mL), and basal estradiol (E2, pmol/L), SHBG (nmol/mL), TSH, prolactin, glycemia (mg/dL), insulin (μU/mL), hemogram, creatinine and hepatic enzymes were measured. Estrogen/progesterone (E2/T) ratio and HOMA-IR were calculated. DS were evaluated by “Beck Depression Inventory” index (BI).

Seventy-two % with low BI (0 to 15; G1), or low depression, versus the 28% with moderate to severe depression (BI >16; G2) didn't differed in abdominal circumference, glycemia, insulin, HOMA-IR. Results in mean±SD, except BI median (variation). \*<0.05

	N	BI	Age	BMI	SHBG	LH	E2	TT	E2/T
G1	31	8 (1-15)	38±11	39±6	42±30	5.2±1.9	103±48	317±109	9.8±4.6
G2	12	20 (18-28)	39±10	38±6	37±18	4.4±1.6	136±48*	290±92	16±9.9*

BI correlated with E2 (r 0.39; p<0.01), E2/T (r 0.37; p<0.02), and not with TT.

The moderate to severe didn't differ to low depressives in metabolic parameters or hypogonadism prevalence.

**Conclusion:** hormonal estrogen-testosterone disequilibrium in obese men may facilitate depression symptoms.

## T2:PS.17

**Training Type, Resting Metabolic Rate, and Fat-Free Mass in Overweight and Obese Women**

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**Purpose:** Controversy exists over the effect of resistance training (RT) vs. aerobic training (AT) on fat-free mass (FFM) and RMR, particularly in overweight/obese individuals. This study was designed to analyze the relative impact of three training types (RT, AT, and AT+RT) on FFM and RMR in overweight women.

**Methods:** Subjects were 38 healthy, sedentary, pre-menopausal, overweight women (38.9±7.0 years; BMI, 29.3±3.5 kg.m<sup>-2</sup>; %FM, 42.0±5.5%; VO2max, 31.1±4.6 ml.kg<sup>-1</sup>.min<sup>-1</sup>), who were randomized into three training groups: AT, RT and AT+RT. All groups trained for 60 minutes, 3 days.week<sup>-1</sup>, for 5 months. RMR was measured by indirect calorimetry. FFM was estimated with dual-energy x-ray absorptiometry (DXA). Within-group differences after 5 months were calculated and ANCOVA was performed to detect differences between groups after training, adjusting for baseline values.

**Results:** Significant reductions in absolute (RT: -205±215; AT: -181±229; AT+RT: -110±164 kcal.day<sup>-1</sup>, p<0.05) and FFM-adjusted (RT: -6.75±4.7; AT: -6.27±5.4; RT+AT: -5.47±4.13 kcal.kgFFM<sup>-1</sup>.day<sup>-1</sup>, p<0.001) RMR were observed. Results for FFM showed increases for AT: 3.99±2.0 kg; RT: 4.02±2.4 kg; AT+RT: 4.62±2.4 kg (p<0.001). No between-group differences were observed (p>0.05). ANCOVA showed an effect of baseline RMR on changes after the training (absolute p<0.01, FFM-adjusted p<0.001).

**Conclusion:** The principal finding of this study was that RMR was suppressed after controlled physical training, despite marked FFM increases. This adaptation should be considered in overweight women undergoing weight reduction. Additionally, resistance training did not induce a differential effect over any measured variable over aerobic training, as predicted from previous research.

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## T2:PS.18

**Different gender response of serum fibrinogen to acute weight loss following gastric bypass.**

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Fibrinogen is an important factor contributing to blood coagulation, it's serum concentration has not been extensively evaluated in the early phase of weight loss in severely obese patients undergoing bariatric surgery. We have studied 28 patients (14 M, 14 F, age 42.0±7.2 years, BMI 50.3±6.1 Kg/m<sup>2</sup>) undergoing laparoscopic Gastric Bypass. Anthropometry (BMI, waist circumference, visceral and subcutaneous fat) and haemato-biochemical parameters (glycaemia, cholesterolaemia, trygliceridaemia, HOMA, CPR, haematocrit, albuminemia, etc.) were assessed at baseline (before surgery) and following 10% and 25% weight loss (WL), obtained on average six and thirty weeks after surgery respectively.

All parameters improved at 10% and 25% WL in all patients and we did not find any significant differences between males and females. Only fibrinogen values showed a significant difference between sexes at 10% WL (370.3±73.4 vs 436.3±73.7 mg/dL; p= 0.03) and at 25% WL (333.2±97.1 vs 448.4±82.9 mg/dL; p=0.004).

Following WL there is a different gender response of serum fibrinogen in patients undergoing bariatric surgery. Further investigations are needed to evaluate long term effects of WL on coagulation factors and to clarify the underlying pathogenetic mechanisms in high thrombotic risk patients.

## T2:PS.20

**High intensity exercise is associated with fat oxidation during post-exercise recovery and after food intake in overweight men.**

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Low-intensity (LI) exercise is known to favour fat oxidation. The efficacy of high-intensity (HI) exercise is unclear in overweight subjects. We studied the effect of either HI or LI on fat oxidation (FO) during exercise and the 7-hours recovery period including food intake after exercise among overweight men.

Ten healthy and sedentary overweight men (27.9±5.6 years, BMI:27.8±1.3 kg/m<sup>2</sup>) cycled to ensure an energy expenditure assessed to be equal to 300 kcal at a LI (35% VO<sub>2</sub>max) or HI (70% VO<sub>2</sub>max). Subjects were fed (in energy balance) 30 min after the exercise bout with an amount of energy intake that did not differ from the amount of energy expended. From indirect calorimetry, Respiratory Exchange Ratio (RER) and oxidization of fatty acids oxidized (FO, g) were calculated over exercise, 30-min recovery before the meal and over 6 hours after the meal.

During exercise, a preferential lipid oxidation was observed during the LI exercise session: RER was higher for HI than for LI trial (p=0.02) and FO was higher for LI trial (17.4±2.2 vs 7.7±1.1 g; p<0.0003). Over the 6 hours of recovery after the meal, FO was higher for HI than for LI trial (39.6±7.9 vs 35.5±5.9 g for HI and LI trials respectively; p=0.03). When considering the cumulative period fitted over the exercise period plus all the recovery period, no difference was observed between HI and LI trial.

HI exercise could be considered for weight management of people, as HI does not impair FO compared to the recommended moderate intensity activity.

## T2:PS.19

**The intragastric behaviour of dietary fat strongly influences fat absorption with minor effects on CCK release and appetite**

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Evidence that ingested fat acts in the intestine to produce satiety originates from studies showing that intraintestinal infusions of fat decreases food intake more than intravenous infusion. Although some studies suggest that even small amounts of dietary fat can induce short term satiety, the satiating properties of orally ingested fat remain poorly understood. In this pilot study we determined the effect of phase separation of fat in the stomach to delay fat absorption in order to influence satiety parameters differently to that of emulsified fat. Six healthy young males were intubated nasogastrically on 4 different occasions (duplicate measures). In the *OV TOP* treatment (OT) subjects received orally a fat-free meal replacement drink (325ml, 145kcal) followed by intragastric infusion of 5g canola oil labelled with <sup>13</sup>C-triolein, to mimic phase separation in the stomach. In the *EMULSION* treatment (EM) the drink contained labelled canola oil (5g) as a fine emulsion; saline was infused as a control. <sup>13</sup>C-oleic acid plasma appearance was significantly (p<0.05) delayed up to 1 h in OT compared to EM. C<sub>max</sub> and T<sub>max</sub> values of CCK were not significantly different between treatments; CCK AUC<sub>240-480min</sub> values were higher (p<0.05) in OT. Between-meal ratings of appetite revealed that hunger and appetite for a snack was diminished to a greater extent by EM than by OT up to 120 min postprandially. However, between 150-240 min appetite for a snack was reduced by the OT. These results indicate that 1) fat emulsions ingested with a meal replacement drink are absorbed more rapidly, whereas absorption of phase separated fat in the stomach is strongly delayed leading 2) to prolonged elevation in CCK plasma levels. The observations from this artificial application of fat suggest that the physicochemical characteristics of small amounts of dietary fat largely affect fat digestion and absorption; its effect on downstream physiological parameters however are much smaller, but could be of benefit in increasing satiety when successfully implemented in food products.

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## T2:PS.21

**Influence of a walking program on the metabolic risk profile of obese postmenopausal women.**

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Menopause transition is well recognized to be associated with an increased prevalence of metabolic syndrome which may partially explain the higher coronary heart disease (CHD) risk. The impact of a 16-week walking program on the metabolic risk profile of sedentary and weakly active postmenopausal women 50-65 years-old, whose body mass index ranged from 29-35 kg/m<sup>2</sup> was examined. Another aim was to verify whether ameliorations in their metabolic risk profile may occur independently from cardiorespiratory fitness (CRF) changes or rather depend on body fatness changes.

**Methods:** 153 women among whom 90 were sedentary and 63 weakly active (1h exercise/week) were subjected to 3 sessions/week of 45 min-walking at 60 of heart rate reserve. Body composition, resting blood pressure (BP), fasting lipid-lipoprotein profile and CRF estimated by  $\dot{V}O_{2max}$  were measured before and after endurance exercise.

**Results:** Sedentary women were heavier, fatter and had lower  $\dot{V}O_{2max}$  at baseline (0.01<p<0.005), compared to weakly active participants. Endurance-training promoted comparable body weight and fat mass losses, waist circumference, BP, cholesterol, LDL-cholesterol and triglyceride level reductions, while it increased both HDL-cholesterol concentrations and estimated  $\dot{V}O_{2max}$ , in both groups, similarly (p<0.0001). In the whole sample, metabolic risk profile improvements were not associated with increases in CRF but rather depended on reduced adiposity. Finally, women whose clinical features of metabolic syndrome at baseline were the highest showed the greatest ameliorations in response to walking (p<0.05).

**Conclusion:** A moderate-intensity physical activity is thus sufficient to reduce metabolic risk profile of postmenopausal women characterized by metabolic syndrome but without overt CHD.

## T2:PS.23

## Psychological and genetic factors related to weight loss in obese female

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**Background:** Weight loss is a complex accomplishment that depends on many environmental, behavioral and genetic influences. The Three Factor Questionnaire (TFEQ)-R18 measures 3 aspects of eating behavior.

**Objective:** We examined biological, psychological, and genetic determinants associated with weight loss using meal replacements.

**Methods:** thirty-two obese female (n=32) followed an 8-wk diet with meal replacement drinks (diet's; SUNTORY Ltd.) under guidance by a dietician. Nutritional counseling focused on hunger and skills for coping with hunger. Counseling sessions conducted 4 times (at baseline, at 1wk, 4 wk, and 8wks). Body weight, body composition, leptin concentration, dietary intake (based on 3-day food records), attitude toward eating (measured by the TEFQ-R18), hunger score (measured with VAS), physical activity, resting metabolic rate (measured with indirect calorimeter), and polymorphisms of the ADRB3 genes were measured.

**Results:** Body weight loss was 4.7±2.0 kg (6.7±2.6 %). Dietary intake was significantly reduced (2014±461 kcal to 1385±327 kcal). The cognitive restraint (CR) score was significantly increased after intervention (13.5 vs. 17.5; p<0.001), while uncontrolled eating (UE) and emotional eating (EE) scores were significantly decreased. The change in CR score was negatively correlated with weight loss (r=-0.681). Changes in UE and EE scores were positively correlated with weight loss (r=0.438 and r=0.475, respectively). There was no difference in weight loss between genotypes. Changes in CR score were associated with weight loss independent of the initial BMI and ADRB3 Trp64Arg allele on multiple regression analysis.

**Conclusion:** These findings emphasized the improvement of psychological factors that are associated with weight reduction in obese female. Effective nutritional counseling is needed to focus on those psychological factors.

## T2:PS.25

## Vitamin and mineral intake: association with weight maintenance after treatment in obese adolescents

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**Introduction:** Energy intake plays a major role in weight change. Micronutrients may also influence weight treatment outcomes. The objective of the present study is to examine the association between vitamin and mineral content of the diet and weight changes during follow up after obesity treatment.

**Patients and methods:** Sixty three obese adolescents participated in a 9 month weight loss program and were subsequently examined at home one and two years after treatment (Rolland-Cachera et al., Int J Obes 2004). Weight and height were measured according to standard procedures and body mass index (BMI) was calculated. Dietary intake was assessed during follow-up using the Dietary history method. Weight status variation was the difference between BMI z-score at the end of follow-up and at inclusion. BMI z-score was computed on the basis of the French references.

**Results:** BMI z-score was 4.2±0.6 at inclusion, 1.8±0.6 at the end of treatment and 2.9±1.18 two years after discharge. A regain in BMI z-score after treatment was associated with energy intake (r=0.43; p<0.001). Partial correlations adjusted for energy intake showed no association between BMI regain and mineral (Na, K, Ca, P, Mg, Fe, Cu, Zn) or vitamin (Retinol, D, E, C, B1, B2, B3/PP, B6, B9/Folates, B12) intakes. High intake of beta-carotene was significantly associated with smaller BMI regain (r=-0.26; p=0.04).

**Conclusion:** Energy intake is the main factor affecting weight regain after treatment. A high intake of beta-carotene reflecting high intakes of fruits and vegetables appears to have a beneficial effect on treatment outcome.

## T2:PS.24

## Variations in hormonal status during different weight loss phases in adolescents involved in a 9 month obesity treatment.

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**Introduction:** Weight loss affects hormonal status as a consequence of nutritional and/or weight changes. The purpose of this study is to analyse changes in hormonal status during the different phases of nutrition and weight changes.

**Patients and methods:** Seventy obese adolescents (14.3±1.2 years at inclusion) participated in a 9 month weight loss program in a medical centre for adolescents and were subsequently examined at home one and two years after treatment (Rolland-Cachera et al., Int J Obes 2004). Treatment included two phases: 7 months of restricted energy intake (1750 kcal) followed by 2 months of mild energy restriction (2200 kcal).

**Results:** Table: Mean and SD for hormonal status at inclusion (T0), at the end of the restricted energy phase (T0+7 months) and at the end of the mild restrictive energy intake phase (T0+9 months):

	T0	T0+7 months	T0+9 months
BMI-Zscores	4.2 (0.6)	2 (0.6)	1.73 (0.6)
Glycemia, g/l	0.96 (0.12)	0.85 (0.14)	0.83 (0.09)
Insulin, µ IU/ml	23.8 (11.4)	9.0 (3.3)	9.9 (6.0)
Leptine, ng/ml	36.3 (15.7)	10.7 (8.1)	11.9 (11.7)
IGF 1, ng/ml	466 (291)	432 (157)	450 (168)
free IGF1, ng/ml	3.2 (2.1)	3.3 (3.1)	2.8 (1.5)
BP1, ng/ml	17.4 (13.6)	35.8 (19.8)	36.9 (20.8)
BP2, ng/ml	267 (239)	382 (169)	378 (170)
BP3, mg/l	4.2 (0.7)	3.9 (0.8)	4.0 (0.8)

BMI-zscore decreased regularly, but variations in hormonal status did not vary as regularly.

**Conclusion:** Weight and hormonal status changes during treatment followed different patterns. Changes in energy intake may also contribute to changes in hormonal status.

## T2:PS.26

## Effects of dietary calcium on blood pressure in young overweight/obese women following two hypocaloric different diets

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**Background:** A number of studies report that the intake of calcium and the consumption of dairy products may modulate blood pressure.

**Objective:** To determine the association between calcium intake and blood pressure in young overweight/obese women group following two slightly hypocaloric diets, independent of weight loss.

**Methods:** The study subjects were 57 women (aged 20-35 years) with a body mass index (BMI) of 24-35 kg/m<sup>2</sup>, randomly assigned to follow one of two hypocaloric diets: Diet V, in which the relative consumption of vegetables was increased, and Diet C, which involved increasing the relative consumption of cereals (especially breakfast cereals). Dietetic and anthropometric data were collected at the start and at the end of the six week intervention period.

**Results:** An increase in dietary calcium density was associated with a reduction in systolic blood pressure of > 4 mm Hg (P<sub>30</sub>) in diet V subjects, diet C subjects, and all subjects as a whole. The higher increment of Ca/protein ratio and the index of nutritional quality (INQ) were also protection factors in diet C. When only those women who were hypertensive at the start of the study were taken into account, an increase in the calcium density and the INQ for calcium were associated with a reduction in the systolic blood pressure of > 4 mm Hg (P<sub>30</sub>) (OR= 0.9496, 95%CI 0.9102-0.9908; p<0.01, and OR= 0.0049, 95%CI 0.00053-0.4676; p<0.05, respectively).

**Conclusions:** Calcium intake could have beneficial effects on blood pressure and therefore cardiovascular risk in women following hypocaloric diets.

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## T2:PS.27

## Negative regulation of fasting ghrelin by high-glycemic index starch diet

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**Background and Aims:** An increase in lipid storage as a consequence of feeding animals with high glycemic index GI diets has been observed by many authors. Fasting plasma ghrelin is lower in Pima Indians, a population with a very high prevalence of obesity, Tschöp et al observed that fasting plasma ghrelin levels are negatively correlated with per cent body fat. The aim of the study was to evaluate the effect of diets with different GI on food intake, growth performances, fat deposition; fasting plasma levels of glucose, ghrelin and insulin.

**Methods:** 20 rats were used, divided in two groups and fed ad-libitum for 21 days with different diets matched for macro and micro-nutrients, but with a different amylose fraction and therefore a different GI.

**Results:** In rats fed high GI diet vs low GI diet was observed: increased food intake (18,9±0,6 vs 16, 4±2 grams/day; P<0,01); increased weight gain (28,8±6,6 vs 16,4±6 % of initial weight; P<0,01); the % weight (related to total weight) of fat pads were higher ( 1,7±0,4 vs 1,4±0,3 %; P=0,05 ); total ghrelin levels were lower (41,1±10,7 vs 59,5±9,8 pg/ml); fasting glucose and insulin levels were similar.

**Conclusions:** Ghrelin is one of the most important orexigen hormones; despite higher ghrelin levels, rats fed the low-GI diet did not increase their food intake, suggesting a decreased ghrelin sensitivity. These findings confirms an enhanced lipodeposition in rats fed the high GI diet; in the same group decreased ghrelin levels may explain the higher fat pad mass.

## T2:PS.29

## Effect of n-3 polyunsaturated fatty acids combined with the weight loss management in moderately obese women

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Polyunsaturated fatty acid of fish origin may influence the outcome of weight management. The effect of eicosapentaenoic (EPA) and docosahexaenoic (DHA) acids can be mediated by GIT peptides and by changes in gene expression in adipose tissue.

**Methods:** 24 moderately obese women were treated by weight reducing regimen with energy deficit for 3 months. Polyunsaturated fatty acid concentrate of fish origin (FO) or placebo (PL, canola oil) 8 g/day were added to the diet. Body composition, lipid fatty acid composition, peptides regulating food intake and mRNA levels of enzymes from subcutaneous adipose tissue were assessed.

**Results:** The average weight loss was not significantly different in both groups. There was significantly higher triceps skinfold decrease (p<0.05) and borderline significant higher fat percentage loss (p<0.10) in FO group in comparison with PL. Proportion of EPA,DHA and sum of n-3 fatty acids increased significantly in serum lipid fractions in FO group. Concurrently, the significant positive correlation of initial DHA in phospholipids with change in plasma adiponectin (r=0.437, p<0.05), plasma neuropeptide Y (r=0.516, p<0.05) and mRNA levels of stearoyl CoA1 desaturase (SCD-1, r=0.591, p<0.01). Negative correlation of initial DHA in phospholipids with change of hormone sensitive lipase mRNA (r=-0.521, p<0.05) and initial DHA in triglycerides with alpha MSH level (-0.516, p<0.05) was found in the whole group.

**Conclusion:** The results suggest higher decrease in subcutaneous fat after 3 months of weight loss with EPA/DHA concentrate in obese women. In the whole group significant correlations of initial DHA with peptides influencing food intake and expression of several lipogenic and lipolytic enzymes were found.

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1.Conflict of Interest: the study was supported by Pronova Biocare, Norway

2.Funding: study was supported by grant NR/7782-4 IGA Ministry of Health,CR and by Pronova Biocare, Norway (see above).

## T2:PS.28

## Effects of a high-protein diet versus a normal-protein diet on body weight and body composition in women with polycystic ovary syndrome.

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**Aim:** To compare the effect of a high-protein diet versus a normal-protein diet on body weight and body composition in women with polycystic ovary syndrome (PCOS).

**Methods:** A randomized, controlled 6-month trial was conducted in 58 women (29 in each group) with PCOS. The women consumed one of two ad libitum diets: a high-protein diet (>40 E% protein and 30 E% fat) (HP-diet) and a normal protein diet (<15 E% protein, 30 E% fat) (NP-diet). The women received monthly dietary counselling. At baseline, 3 and 6 months anthropometric measurements were performed and the participants did three 3-days weighed food registrations and 24hrs urine collection.

**Results:** 27 completed the study (HP: n=14, BMI=29.6±2.2 kg/m<sup>2</sup> (mean±SEM); NP: n=13, BMI=29.3±1.4 kg/m<sup>2</sup>). During the intervention the HP diet group increased protein intake (to 26 E%) and fat intake, and decreased carbohydrate intake. The NP group did not have any changes in macronutrient intake. Protein intake estimated from the urinary protein excretion showed the same pattern. No difference in energy intake was seen (P=0.12). The HP diet group had a greater weight loss (HP: 7.7±1.6 kg, NP: 3.3±1.1 kg; P=0.0002) and loss of fat mass (HP: 6.4±1.3 kg, NP: 2.2±0.9; P=0.002), and a greater reduction in waist circumference (HP: 7.4±1.5cm, NP: 3.7±1.3cm; P=0.004) than the NP diet group. There was no difference in changes in lean body mass between the two diet groups.

**Conclusion:** Replacement of carbohydrates with protein in ad libitum diets is a promising approach for weight reduction in PCOS women.

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## T2:PS.30

## Exercise capacity of very obese patients entering an obesity rehabilitation program.

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**Objectives:** To measure how very obese subjects score on exercise tests, a 6 minute walking test and maximum ergometer test. Subject scores were compared to reference values for each test.

**Subjects:** All patients entering the obesity rehabilitation program at Reykjalundur Rehabilitation center during 2003-2005 were tested. The group consisted of 181 patients, 149 women and 32 men. Mean age was 37.8 (± 12.6) and mean body mass index (BMI) was 46.0 (± 6.1).

**Methods:** At the start of the program subjects did two 6 minute walking tests and one maximum ergometer test. Scores for the best 6 minute walking test were compared to reference values. Scores on the maximum ergometer test were compared to reference values for absolute watts (Wmax) and watts per kilo (W/kg).

**Results:** The table shows values for absolute watts and watts per kilo from the maximum ergometer test compared with predictive reference values (mean ±SD). Outcome from the 6 minute walking test was compared with predictive values.

		N	Wmax (% pred)	W/kg (%pred)	6MWT (%pred)
Females	≤40 years	94	166±24 (84±12)	1.28±0.23 (46±9)	570±54 (81±78)
	>40 years	55	135±32 (78±14)	1.14±0.30 (46±11)	540±85 (83±12)
Males	≤40 years	18	219±45 (72±16)	1.39±0.38 (38±10)	610±42 (79±6)
	>40 years	15	180±53 (73±16)	1.18±0.28 (40±10)	540±81 (77±8)

**Conclusion:** Very obese patients have markedly lower exercise capacity than reference subjects, both when in terms of absolute values and especially when related to their weight. Structured individualized physical training is crucial for realizing their aim to improve physical performance.

## T2:PS.31

## Variations in body fluids and resting metabolic rates in overweight and obese women during menstrual cycle

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**Context:** The impact of sex hormones on body fluids during the menstrual cycle has been studied with divergent results. Some renal and systemic alterations, (primary vasodilation) have been shown in the post-ovulatory phase, and seric osmolality exhibits a diminishing trend from the follicular to the luteal phase. Physiological studies on extracellular osmolality variations suggest that cell volume changes may influence substrate metabolism, but this has not been proved in specific menstrual cycle studies on obese people.

**Aim:** To verify if variations in Extra Cellular Water and Total Body Water are associated to changes in substrate metabolism and BMI.

**Subjects:** 15 normally cycling overweight and obese patients, aged 25-45 yr, ( $25 \geq \text{BMI} \geq 40$ )

**Methods:** Along their menstrual cycle, subjects reported food intake, weight, appetite and thirst daily, and underwent physical examination, body composition assessment (by anthropometric measurements and bioelectrical impedance analysis for the evaluation of TBW, ICW, ECW, FFM and FM) and Resting Metabolic Rate with substrate oxidation (by indirect calorimetry), in the midfollicular, ovulatory, midluteal phase of their cycle. Food intakes macronutrients and micronutrients were processed with the aid of a dietetic software.

**Results:** Not yet available as the patients have not completed all the steps of the study. Till now the RMR seem to follow a common trend, the lowest values being situated in the ovulatory phase and the highest in the follicular one. For as regards substrates, lipid oxidation is higher during the luteal phase, in contrast to carbohydrate oxidation.

## T2:PS.33

## Meta-Analysis of Drop Out from All Causes and Adverse Events in RCTs of Orlistat, Sibutramine and Rimonabant

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**Background:** There is concern regarding both compliance to and adverse events (AEs) of weight loss compounds. Drop out from any cause can be interpreted as a composite measure for safety and compliance, and AEs as a general indicator of safety.

**Objective:** To investigate the safety and compliance of orlistat, sibutramine and rimonabant.

**Methods:** A systematic search of PubMed was performed (2007-11-07). Data were collected from RCTs > 1y (n=27; n<sub>patients</sub>=13685) using doses within the EMEA indication. Pooled risk ratios (RRs) for drop out were calculated by a random effects model.

**Results:** Treatment with orlistat was associated with a significantly reduced risk of drop outs from any cause compared to placebo (Table). Similar trends were observed for rimonabant and sibutramine. Rimonabant and orlistat resulted in significantly more drop outs due to AEs than placebo, while there was a trend of no difference in risk for sibutramine. The placebo groups showed similar drop out rates for any cause, but not for AEs, for the different compounds.

	Drug vs. placebo			
	Drop outs		AE drop outs	
	Absolute	Pooled RR (95%CI)	Absolute	Pooled RR (95%CI)
Orlistat	29% vs. 38%	0.77(0.70-0.84)	8% vs. 5%	1.62(1.21-2.18)
Sibutramine	34% vs. 37%	0.90(0.80-1.02)	9% vs. 10%	1.00(0.74-1.35)
Rimonabant	41% vs. 42%	0.93(0.87-1.01)	14% vs. 7%	1.92(1.55-2.38)

**Conclusion:** Orlistat was associated with the best compliance, while the greatest risk (absolute&relative) for drop out due to AEs was seen for rimonabant. The heterogeneity in drop out rate due to AEs in the placebo groups calls for common comparator adjusted analyses and/or head-to-head trials.

## T2:PS.32

## Visfatin expression in subcutaneous adipose tissue of premenopausal women: relation to hormones and weight reduction.

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**Aim:** The objective of this study was to investigate the relationship of visfatin expression in adipose tissue with potential hormonal regulatory factors such as insulin, testosterone and tumor-necrosis factor-alpha (TNFalpha) and the effect of the diet-induced weight-reduction on adipose tissue mRNA expression and plasma levels of visfatin.

**Materials and methods:** Biopsy of subcutaneous abdominal adipose tissue (SCAAT) and plasma samples were obtained from 28 premenopausal women (age  $38.7 \pm 1.7$  years, BMI  $27.9 \pm 1.4$  kg/m<sup>2</sup>), consisting of 10 lean and 18 overweight/obese subjects. The subgroup of 18 overweight/obese women (age  $39.4 \pm 2.1$  years, BMI  $32.2 \pm 1.4$  kg/m<sup>2</sup>) underwent a 12 week hypocaloric weight-reducing diet. Biopsy samples were analyzed for visfatin and TNFalpha mRNA levels and plasma was analyzed for relevant metabolites and hormones.

**Result:** Visfatin mRNA expression in SCAAT was negatively correlated with plasma free testosterone in all subjects ( $r = -0.532$ ,  $p < 0.01$ ), plasma insulin ( $r = -0.469$ ,  $p < 0.01$ ) and BMI ( $r = -0.488$ ,  $p < 0.01$ ) and positively correlated with adipose tissue TNFalpha mRNA expression ( $r = 0.648$ ,  $p < 0.001$ ). The diet resulted in the reduction of body weight (by 8%); plasma insulin levels, free testosterone and TNFalpha were also reduced. Visfatin and TNFalpha mRNA expression in adipose tissue and plasma levels of visfatin remained unchanged.

**Conclusion:** In obese females, visfatin mRNA expression in SCAAT is related to TNFalpha expression and to plasma free testosterone and insulin. This suggests the regulatory role of these hormones. Adipose tissue visfatin expression is not altered by a moderate, diet-induced, weight loss.

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## T2:PS.34

## Regional fat distribution in adolescent anorexic patients before and after medium and long-term weight gain

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**Background:** Short term weight recovery in Anorexia Nervosa (AN) leads to increased visceral fat (Mayer et al, AJCN 2005). It is unknown whether this fat distribution persists in the long term.

**Aim:** To assess fat redistribution in AN during medium and long-term recovery.

**Methods:** BMI, waist (wc) and hip (hc) circumference, total and trunk fat (DXA) was measured in 35 adolescent AN before and after medium-term (7 months, Mt); in 24 of these after long-term (26 months, Lt) recovery; and in 25 normal weight controls (C).

**Results:**

	Mt-AN(T0)	Mt-AN(7m)	Lt-AN(T0)	Lt-AN(26m)
<b>BMI</b> (kg/m <sup>2</sup> )	<sup>p=0.051</sup> 16.0 • 1.3	17.7 ± 1.8 <sup>z</sup>	16.8 • 1.7	19.3 • 2.5 <sup>z</sup>
<b>Wc</b> (cm)	58.6 ± 4.5	62.4 ± 4.6 <sup>z</sup>	60.7 ± 4.1	65.6 ± 5.6 <sup>z</sup>
<b>Hc</b> (cm)	71.7 ± 5.5	74.6 ± 5.4 <sup>z</sup>	73.1 ± 6.4	90.7 ± 8.7 <sup>z</sup>
<b>Trunk fat</b> (kg)	<sup>x</sup> 2.3 ± 1.2	4.5 ± 2.2 <sup>z</sup>	3.2 ± 1.8	6.5 ± 3.1 <sup>z</sup>
<b>Total fat</b> (kg)	<sup>x</sup> 6.0 ± 2.7	10.0 ± 4.1 <sup>z</sup>	7.8 ± 3.6	14.7 ± 5.7 <sup>z</sup>
<b>Trunk:total fat</b> (%)	36.9 ± 6.1	42.1 ± 6.3 <sup>z</sup>	40.1 ± 6.6	42.7 ± 6.3 <sup>z</sup>

<sup>x</sup>, sig. diff. from Lt-AN,  $p < 0.05$ ; <sup>z</sup>, sig. changes,  $p = 0.000$ ;

Despite lower trunk fat, w/h was increased in AN(T0) compared to C (0.82 vs. 0.78,  $p = 0.006$ ). In Lt-AN, increases in trunk fat were negatively related to baseline BMI and wc ( $p < 0.05$ ). Hc in Lt-AN at 26m was higher than in C ( $p = 0.037$ ).

**Conclusion:** During weight gain in AN, low baseline trunk fat (DXA) normalized, but increases in hc were over proportional.

There is no conflict of interest. The project was funded by grants of the Center of Research into Adolescents Health (Sydney), The James Fairfax Institute of Pediatric Nutrition (Sydney), and The German Academic Exchange Service (Bonn).

## T2:PS.35

**Body fat distribution and the metabolic syndrome; the effect of exercise and diet restriction**

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**Objective:** To examine the independent and additive effect of exercise in addition to weight loss on body fat distribution and at the metabolic syndrome.

**Method:** A total of 79 obese but otherwise healthy men and women (age 36.6±7; BMI 34.5±4 kg/m<sup>2</sup>) were randomized into three treatment groups: DIO (8 weeks very low energy diet (VLED) 600 kcal/d + 4 weeks weight maintenance diet); DEX (8 weeks VLED 800 kcal/d + 4 weeks weight maintenance diet together with 12 weeks supervised exercise); EXO (12 weeks supervised exercise without diet restriction). MRI technology was used to quantify the visceral adipose tissue (VAT) and subcutaneous abdominal tissue (SAT) and the NCEP ATP3 definitions were used to define the metabolic syndrome.

**Results:** Subjects in the DEX and the EXO group improved their VO<sub>2</sub>max with 15% whereas no change in VO<sub>2</sub>max in the DIO group was observed. A relative weight loss of 11% in the DEX and DIO group was achieved, with a trend to a higher relative reduction of VAT in the DEX group (P=0.08). A total weight loss of 3% in the exercise-alone group (EXO) was accompanied by a 15% reduction of VAT. At baseline the metabolic syndrome was present in 51% of all subjects (DEX 67%; DIO 42%, EXO 41%) whereas after intervention for 12 weeks the prevalence was decreased to 12% (DEX 14%, DIO 5%, EXO 18%)

**Conclusion:** Regular exercise without diet restriction reduced VAT with 15% and decreased the prevalence of the metabolic syndrome with ≈25%. In combination with diet restriction, exercise has pronounced effect at body composition and the obesity-related metabolic disturbances.

## T2:PS.37

**The efficacy and tolerability of taranabant, a cannabinoid receptor inverse agonist, over 24 weeks in obese patients**

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**Background:** In a previous 12-week study of obese patients, taranabant, a cannabinoid-1 receptor inverse agonist, induced significant weight reduction and was generally well tolerated. Here we present 24-week results from an 80-week randomized placebo controlled trial.

**Methods:** 532 obese patients (81% female; BMI 27 to 43 kg/m<sup>2</sup>; age ≥18 years) were randomized to taranabant 2, 4, 6 mg qd or placebo for 80 weeks. The primary endpoint was change from baseline in body weight at week 24. A subset of 200 patients underwent total body MRI for adiposity assessments. Tolerability was evaluated with clinical/laboratory examinations and reported adverse events. Adverse events were analyzed with a multi-tiered approach.

**Results:** Baseline characteristics were similar among groups. Discontinuation rates were 32, 25, 24, and 21% for taranabant 2, 4, 6 mg, and placebo. Least-squares mean body weight changes from baseline at week 24 for taranabant 2, 4, 6 mg and placebo were -5.9, -6.5, -7.2, and -2.8 kg, (p<0.001 taranabant vs placebo). Percentages of patients who lost ≥10% body weight were 23, 24, 29, and 9% for taranabant 2, 4, 6 mg and placebo (p≤0.005 taranabant vs placebo). Significant reductions in visceral adiposity were seen with taranabant. Taranabant (2, 4, and 6 mg) was associated with increased psychiatric, gastrointestinal, and nervous system adverse events at the system organ class level.

**Conclusions:** Taranabant at all doses led to clinically and statistically significant weight loss at 24 weeks. Taranabant was associated with increased incidence of psychiatric, gastrointestinal, and nervous system adverse events. Research relating to this abstract was funded by Merck & Co., Inc.

## T2:PS.36

**A Systematic Review of Long-Term Randomised Controlled Trials of Group versus Individual Treatments for Adult Obesity**

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**Objective:** To systematically review evidence for the use of group versus individual modes of delivery of treatments for adult obesity.

**Method:** Based on agreed a priori criteria, we searched electronic databases and secondary references for randomised controlled trials of treatments for adult obesity among participants with BMI>28kg/m<sup>2</sup>, and age>18 years, comparing at least one group-based to one individual-based treatment group, and follow up of at least one year. Data extraction and quality assessment were performed by one reviewer and checked by the second. Meta-analyses comparing weight change in group-based to individual-based treatment groups were conducted.

**Results:** Six studies fulfilled all criteria (two from the UK and four from the US), and were conducted by dietitians and psychologists. Included studies failed to report some important aspects of randomised controlled trials (concealment of random allocation, blinding, and intention to treat analysis). All studies stated numbers of dropouts, and reasons for withdrawals were described in three studies. Participants' ages ranged from 20 to 76 years, and BMI from 30 to 49kg/m<sup>2</sup>. Socio-economic data were reported in only two studies, and provision of training in group-based treatment delivery was explicit in one study only.

We found a significant difference in favour of group-based rather than individual treatment at 12 months. Post hoc subgroup-analysis also showed that trial attributes associated with greater effectiveness were the use of financial incentives, the health professional being a psychologist, and participants being women.

**Funding:** Alison Avenell is funded by a Career Scientist Award from the Chief Scientist's Office of the Scottish Executive Health Department.

## T2:PS.38

**Poor prediction of Resting Energy Expenditure in severely obese women by commonly used equations: No improvement by adding body composition data**

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Predictive equations for resting energy expenditure (REE) are mainly based on a wide BMI range and often limited by over-/underestimation. We tested nine established and two new equations in severely obese women.

Study group consisted of 160 women (age=41.3±13.2y, BMI=42.8±7.5kg/m<sup>2</sup>) with a REE of 1919±129kcal/d measured by indirect calorimetry (REE-IC). Nine established equations were used to predict REE. REE and REE-IC were compared by Bland-Altman-Plots. New REE prediction equations were calculated by linear regression analysis, based on anthropometric (REE1) or body composition parameters FM and FFM by BIA (REE2) and were tested in a validation group of 33 obese women (age=40.4±7.9y, BMI=37.2±4.6kg/m<sup>2</sup>, REE-IC=1947±128kcal/d).

In the study group REE-IC correlates with all established equations (r>0.782, p<0.001), although six equations underestimated REE-IC (p<0.05) in general. For all equations REE was predicted accurately (i.e. REE-IC±5.0%) in only 32.2±10.8%. All equations overestimated REE within low and underestimated REE within high REE-IC range (p<0.05). For REE1 weight and age explained 64.9% of REE-IC. Employing body composition parameters, FM combined with FFM and age explained 65.2%. In the validation group REE1 and REE2 correlated with REE-IC (r>0.687, p<0.001), but underestimated REE-IC (p<0.05) as did seven established equations. New as well as established equations over- and underestimated REE in low and high REE-IC range, respectively (p<0.05).

All equations showed a poor prediction of REE in obese women. Embedding body composition parameters to equations did not improve the quality of prediction. To minimize over- and underestimation, area of application for all equations should be stated precisely.

**T2:PS.39****Two snps in the cd36 gene promoter are associated with lipid profile during a weight loss and maintenance period in obese subjects**Goyenechea, E<sup>1</sup>, O'Dell, SD<sup>2</sup>, Collins, LJ<sup>2</sup>, Parra, D<sup>1</sup>, Abete, T<sup>1</sup>, Crujeiras, AB<sup>1</sup>, Martínez, JA<sup>1</sup>.<sup>1</sup>Dpt. Nutrition, Food Science, Physiology and Toxicology, University of Navarra, Pamplona, Spain.<sup>2</sup>Nutritional Sciences Division, King's College London, London, United Kingdom.

**Introduction:** Different common polymorphisms of the CD36 gene have been associated with lipid metabolism and cardiovascular disease. The aim of the current study was to investigate the association of two CD36 gene promoter SNP genotypes with anthropometrics, dietary intake and lipid profile in subjects with excessive body weight during a weight loss and maintenance period.

**Methods:** A group of 183 (95 male/ 88 female) individuals [Body mass index: 30.6 ± 3.0 kg/m<sup>2</sup>; age: 35 ± 5 y] were genotyped for CD36 gene -33137 A/G (rs1984112) and -22674 T/C (rs2151916) promoter polymorphisms by pyrosequencing. Anthropometrical measurements and circulating lipid profile were measured at baseline, following an 8-week low calorie diet (LCD) and 6 months later. Dietary intake was determined before and after the LCD with a validated 24 hours weighted food records.

**Results:** Both SNP genotypes were in Hardy-Weinberg equilibrium ( $p > 0.05$ ) and in complete linkage disequilibrium ( $D' = 1.0$ ). At baseline, the saturated fatty acid (SFA) intake tended to be lower in carriers of the minor alleles (G+/C+) ( $p = 0.085$ ), reaching significance at the end of the weight loss period ( $p = 0.034$ ). Six months after the end of the LCD, the minor allele was significantly associated with lower total ( $p = 0.032$ ) and LDL- ( $p = 0.014$ ) cholesterol and higher HDL-cholesterol ( $p = 0.013$ ).

**Conclusion:** These results suggest that in obese individuals both SNPs of the CD36 gene promoter are associated with lower SFA intake during a weight loss period, and with improved lipid profile in the subsequent weight maintenance stage.

**Funding:** E. Goyenechea is supported by the Dpt. of Education, Universities and Research of the Basque Government, Spain. The project was supported by the Linea Especial from University of Navarra (LE/97), Spain and by the Wellcome Trust, Project grant No. 073142, UK.

**T2:PS.41****Children's Experiences of a School-Based Obesity Intervention Project**Boniface, M<sup>1</sup> and Potter, J<sup>1</sup><sup>1</sup>University of Chichester, West Sussex, England

The increasing prevalence of childhood obesity in the Western world has resulted in intervention projects aiming to positively influence the diet and exercise habits of young people. Whilst there has been research into their effectiveness, there has been little consideration of participation from the child's perspective. This small-scale interpretive study employed semi-structured interviews to explore experiences and perceptions of 10 pupils on a school-based intervention project. Consideration was given to the structure and content of sessions, and the nature, form and impact of participation. Analysis of the data revealed key themes related to: perceptions of the project; feelings about being identified as 'over-weight' or 'obese'; motivations to attend and adhere to the scheme; the impact of attendance; long-term expectations and impact on family members.

The findings revealed a positive view of all aspects of the scheme, with the 'fun' activities, the inclusion of friends and the activity and diet task cards being identified as key motivators. Pupils accepted responsibility for the 'over-weight' label and welcomed the opportunity to positively influence their health and fitness. Attending the project had assisted when seeking support from family members; participants placed value on behaviour endorsed by the project and in making changes to exercise patterns and diet, gained pleasure from resultant feelings of control. Pupils assigned a high priority to long-term aims relating to more positive social interaction, loss of weight, and increased fitness levels enabling them to take a more active part in identified sports and activities.

The intervention was funded by Tanita UK but this had no bearing on the outcomes of the research

**T2:PS.40****Predictors of weight loss, success and drop-out after 12 weeks on a Very Low Calorie Diet**Gripeteg, L<sup>1,2</sup>, Karlsson, J<sup>1</sup>, Torgerson, J<sup>1</sup>, Lindroos, AK<sup>1,3</sup><sup>1</sup>Department of Molecular and Clinical Medicine, Institute of Medicine, the Sahlgrenska Academy, Göteborg University, Göteborg, Sweden; <sup>2</sup>The Vårdal Institute, Lund, Sweden; <sup>3</sup>MRC Human Nutrition Research, Cambridge, United Kingdom

**Aim:** To find predictors for successful and unsuccessful outcome of a 12-week VLCD treatment.

**Subjects:** 267 patients (177 women, 90 men, mean±SD age 40.2±9.7, BMI 41.9±6.4 kg/m<sup>2</sup>) remitted to an obesity intervention study initiated with a 12-w VLCD.

**Methods:** 10 % or greater weight loss was regarded as successful outcome. Stepwise multivariate and logistic regression were used to predict 12-w weight loss, successful outcome and attrition. Women and men were analyzed separately. Potential predictors were anthropometry, eating behaviour, health-related quality of life and socio-economic variables at baseline.

**Results:** 64 % of patients lost more than 10 % of their weight. Weight loss in successful women was 16.1±3.5 % and in men 17.1±4.7 %. Unsuccessful women and men lost 5.8±2.7 % and 5.9±2.4 %. 12-w weight loss in women was predicted by higher number of children, lower educational level and better physical health (sum. score SF-36),  $R^2 = 12.7$  %. In men, weight loss was predicted by better ambulation capacity, cohabiting and higher frequency of ice-cream intake,  $R^2 = 39.4$  %. Successful outcome was predicted by less psychosocial problems in women (OR, 95 % CI) 0.98 (0.97-0.999), and in men, better functioning in social interaction 1.02 (1.004-1.04) and ambulation 1.02 (1.003-1.04). Attrition was predicted by lower age 0.92 (0.88-0.97) and higher hip circumference 1.03 (1.001-1.07) in women, and in men, lower perceived general health 0.97 (0.94-0.99).

**Conclusions:** The range of outcome predictors is different for women and men. Functional health seems important for success in men, whereas age predicts VLCD attrition in women.

**Funding:** Research relating to this abstract was funded by The Health & Medical Care Committee of the Region Västra Götaland.

**T2:PS.42****Efficacy and consistency of a franchising weight loss programme in the Swedish commercial sector**Hemmingsson, E<sup>1</sup>, Sundström, J<sup>2</sup>, Marcus, C<sup>3</sup><sup>1</sup>Karolinska Institutet, Department of Medicine, Stockholm, Sweden<sup>2</sup>Uppsala University, Department of Medical Sciences, Uppsala, Sweden<sup>3</sup>Karolinska Institutet, Division of Pediatrics, Stockholm, Sweden

**Background:** Commercial weight loss programmes with a scalable structure, operating according to a defined manual including regular quality controls, can partner health professionals when public care is lacking.

**Aim:** To clarify consistency of weight loss (across years and locations) of a commercial franchise company (Itrim) in Sweden.

**Methods:** Weight loss at 12 months was analysed for the years 2004-2006, across 11 centres (6 cities), before and after adjustment for baseline body weight, age, gender, and group session attendance. 970 consecutively recruited participants (BMI 31.5 kg/m<sup>2</sup> [sd 5.5], age 47.1 yrs [11.4], 86 % women) were included. The programme consisted of 20 one hour group sessions on diet and exercise behaviour change, physical activity (circle training 2-3 times/wk á 30-45 min + pedometers), individual coaching at 0, 10, 26 and 52 weeks, meal replacements, home assignments, and food and exercise diaries. Participants paid their own fee (approx €1000/yr.).

**Results:** Mean weight loss at 12 months was 10.5 kg (95 % CI: 10.0 to 11.1). In unadjusted analysis, there was a significant weight loss difference between centers ( $p = 0.03$ ) but not between years ( $p = 0.16$ ). After adjustment for covariates, the difference in weight loss between centers was attenuated ( $p = 0.10$ ). Predictors of weight loss were instead baseline body weight (Beta = 0.3 per baseline kg,  $p < 0.001$ ), group session attendance (Beta = -0.49 per session,  $p < 0.001$ ), gender (Beta = 2.4 men > women,  $p < 0.002$ ), and age (Beta = 0.06 younger > older,  $p < 0.008$ ).

**Conclusions:** Commercial companies, operating according to a defined manual including regular quality controls, can provide consistent weight loss results across time and locations.

**Conflic of interest:** EH works part time as Itrim's Programme Director. JS and CM are members of Itrims Scientific Advisory Board.

## Track 2 Poster Presentations

## T2:PS:43

**Beta-glucan and/or fructo-oligosaccharide in bars does not suppress hunger or energy intake when taken for two days**Peters, HPF<sup>1</sup>, Boers, HM<sup>1</sup>, Haddeman, E<sup>1</sup>, Melnikov, SM<sup>1</sup>, Qvyjt, F<sup>2</sup><sup>1</sup>Unilever Food and Health Research Institute, Vlaardingen, The Netherlands<sup>2</sup>Unilever R&D, Covington TN, USA

**Background:** Increasing gastro-intestinal viscosity or colonic fermentation are suggested to reduce hunger and food intake. Beta-glucan (BG) and fructo-oligosaccharide (FOS) are food ingredients proposed to act this way, but results so far remain inconclusive. We have tested FOS, BG, or their combination on hunger and energy intake during 2 consecutive days.

**Methods:** In a 4-way cross-over double-blind randomized design 21 volunteers (BMI 25.9) received during 2 consecutive days, a Slim-Fast high protein meal replacement bar at 09.00h and an *ad libitum* lunch at 13.00h. On day 1 only, subjects consumed a second (identical) bar at 17.00h and a fixed snack at 19.00h. Bars (isocaloric) contained either 1) oats (control, 0.3g BG), 2) 1g added BG (using barley), 3) 8g added FOS, or 4) 1g added BG and 8g added FOS. To accommodate added fibres, all or part of the oats was removed. Hunger/satiety parameters (6 line scales) were regularly scored, and *ad libitum* meal intake measured. Bar viscosities were also determined under simulated gastric conditions. All parameters were analyzed using ANOVA and (where appropriate) baseline values as covariates.

**Results:** Addition of BG, FOS or their combination did not diminish hunger or food intake, although addition of BG to the bar doubled apparent gastric viscosity (841 vs 351 mPa.s).

**Discussion:** BG, FOS or their combination in bars at these levels did not affect hunger when given for 2 consecutive days. Efficacy might be increased by testing them for a longer period, increasing the BG content, or by using BG with even higher gastric viscosity.

**Conflict of Interest/Funding:** all authors are Unilever employees. All research relating to this abstract was funded by the Unilever Food & Health Research Institute

## T2:PS:45

**The dietary supplement Zantrex-3 possess thermogenic and appetite suppressant properties**

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**Background:** Zantrex-3 is a popular dietary supplement for weight control that consists of a combination of yerba mate, guarana, caffeine and damiana. The combination has previously been shown to decrease gastric emptying and it is likely that the weight controlling effects are related to an increased satiety and thermogenesis.

**Objective:** To investigate the effect of Zantrex-3 on energy expenditure, hemodynamic factors, subjective appetite sensations, and on *ad libitum* energy intake (EI).

**Design:** Twenty-three men (BMI: 23.9±3.2 kg/m<sup>2</sup>, mean±SD) participated in a randomized, double-blind, placebo-controlled crossover study. The Zantrex-3 compound contained 300 mg xantines (caffeine and caffeine-like stimulants), yerba mate, guarana and damiana. The thermogenic effect was measured for 3 hours post-intake. Blood pressure (BP), heart rate (HR) and appetite ratings were assessed every half hour.

**Results:** Zantrex-3 induced a thermogenic response of 7% above baseline value (62.1±8.1 kJ/3-h (mean±SE), P<0.0001) compared to placebo and increased the respiratory quotient by 2% (0.02±0.01, P=0.03). Systolic and diastolic BP were increased by 4% (5.1±1.1 mmHg, P<0.0001) and 3% (2.1±1.0 mmHg, P=0.03) compared to placebo, whereas no effect was observed on HR. The sensation of satiety and fullness increased by 8% (P=0.01) and 11% (P=0.001), compared to placebo, whereas the sensation of hunger and prospective intake decreased by 7% (P<0.0001) and 5% (P<0.0001), respectively.

**Conclusion:** Zantrex-3 induced a thermogenic response of 7% and seems to have potential appetite suppressants properties. The increase in BP was acceptable and consistent with the caffeine content, and has been shown to decrease with chronic use due to tachyphylaxia.

**Funding:** Research relating to this abstract was funded by Basic Research, Salt Lake City, UT, US.

## T2:PS:44

**The acute effects of a high protein lunch on energy and substrate utilization, ghrelin, glucagon-like peptide 1, PYY concentrations, and satiety**Smeets, A.J.P.G.<sup>1,2</sup>, Soenen, S.<sup>1,2</sup>, Luscombe-Marsh, N.D.<sup>1,2</sup>, Ueland, Ø.<sup>3</sup> and Westerterp-Plantenga, M.S.<sup>1,2</sup><sup>1</sup>Maastricht University, Department of Human Biology, Nutrition and Toxicology Research Institute Maastricht (NUTRIM), P.O. Box 616, 6200 MD, Maastricht, The Netherlands.<sup>2</sup>Top Institute Food and Nutrition, P.O. Box 557, 6700 AN, Wageningen, The Netherlands.<sup>3</sup>Matforsk AS, The Norwegian Food Research Institute, N-1430 Ås, Norway.

High-protein foods are more satiating and have a higher thermogenic effect than normal protein foods, over the short as well as over the long-term. We hypothesized that an acute effect of higher protein intake on satiety may be related to acute metabolic and hormonal responses. The study had a single blind, randomized, crossover design. Subjects underwent two indirect calorimetry tests for measurement of energy expenditure (EE) and substrate oxidation. After a standard subject-specific breakfast, subjects received one of two randomly assigned treatments: appropriate protein (AP) lunch (10%E protein, 60%E carbohydrate, 30%E fat), or high-protein (HP) lunch (25%E protein, 45%E carbohydrate, 30%E fat). Post-lunch EE increased 0.85±0.32 kJ/min after HP lunch and 0.73±0.22 kJ/min after AP lunch (p=0.07). RQ was 0.84±0.04 in HP condition and 0.86±0.04 in AP condition (NS). Satiety Visual Analog Scales (VAS) scores were significantly higher 30min, and 120min after HP lunch than after AP lunch. AUC satiety VAS score was significantly higher after HP lunch than after AP lunch (HP 263±61 VAS mm.h, AP 236±76 VAS mm.h; p<0.02). Observed effects on satiety and diet induced thermogenesis did not coincide with effects on plasma ghrelin, GLP-1 and PYY concentrations. A single HP lunch, therefore, seems to exert its acute effect on satiety not through increased concentrations of satiety related hormones. Short-term effects of the single high protein meal on satiety in the present study may reflect satiation rather than satiety. Other factors, which may explain the HP effect on satiety, may be metabolites or amino acids.

The study was funded by DiOGenes (Contract no. FP6-513946) which raises no potential duality of interest.

## T2:PS:46

**Different 2-year effect of an inpatient intervention on body fat in obese girls and boys**Dresel, J<sup>1</sup>, Bock D<sup>1</sup>, Knöpfli B<sup>1</sup><sup>1</sup>Alpine Children's Hospital Davos, Switzerland

**Background:** Usually, treatment of patients with juvenile obesity is equal between genders, although caloric needs, nutrition, trainability, interests, and life styles differ. Such uniformity has to result in a different gender related success rate. The present study evaluates the gender related 2-year follow-up of an inpatient intervention on body fat.

**Methods:** 5 obese girls and 13 boys were tested before (IN) and after an 8-week inpatient program (8W), after 6 months (6MFU), 13 months (13MFU), and 24 months (24MFU) post-hospitalization program. Girls were 13.8±2.1 years old with a body weight of 74.8±11.8kg and a body mass index of 33.9±2.8kg/m<sup>2</sup> (P>98); boys 13.8±2.1 years, 79.9±17.2kg and 34.3±2.9kg/m<sup>2</sup> (P>98). The inpatient program was based on a multicomponent treatment and education focusing on nutritional changes, behavioral modifications and physical activity. A major effort was done in planning for, and monitoring each patient's post-hospitalization program. Body fat was measured by DEXA.

**Results:** In boys percent body fat decreased throughout the inpatient program from 45.5±2.1 to 40.9±3.5% (p<sub>IN-8W</sub>=0.031) and half a year later to 35.6±6.1% (p<sub>IN-6MFU</sub><0.001). This significant success lasted up to 2 years: at 13MFU 35.8±7.1 and at 24MFU 36.5±7.7%; p<sub>IN-13MFU</sub><0.001 and p<sub>IN-24MFU</sub><0.001. A completely different pattern occurred in girls, who did not reach any significant effect: IN 48.7±3.3, 8W 46.6±3.5, 6MFU 45.3±3.6, 13MFU 47.5±4.4, 24MFU 48.2±4.3%; p<sub>IN-8W</sub>=ns(0.99), p<sub>IN-6MFU</sub>=ns(0.83), p<sub>IN-13MFU</sub>=ns(0.99), p<sub>IN-24MFU</sub>=ns(1.00).

**Conclusion:** Equal multi-disciplinary treatment of both genders was not as effective in girls as in boys concerning body fat. Specific therapeutic intervention may be indicated to reach success also in females.

## T2:PS:47

**A sports camp doesn't have effect on children's degree of obesity – longitudinal controlled study**Nowicka P<sup>1</sup>, Pietrobelli A<sup>2</sup>, Ek A<sup>1</sup>, Bengtsson B<sup>1</sup>, Flodmark C-E<sup>1</sup><sup>1</sup> Childhood Obesity Unit, University Hospital Malmö, Sweden.<sup>2</sup> Pediatric Unit, Verona University Medical School, Verona, Italy

**Introduction:** Increased physical activity is beneficial in the treatment of childhood obesity. The aim of the study was to reduce the degree of obesity by using a sports camp followed by six months support from local sports clubs.

**Patients and Methods:** Seventy-seven children (50% males) aged 8-12 years (mean age 10.5 years, mean BMI 29.0, SD±3.0; mean BMI SDS 3.43, SD±0.5) were sent from school health care to a tertiary referral centre for treatment and invited to participate in a sports camp of one week. The subjects were randomized in 2 groups (control and intervention). The intervention group tested various sports every day during the camp. In the end of the camp the children chose their favourite sport. A sports trainer from a local sports club was assigned to support the child to participate in the chosen sport in this sports club during six months. Body weight and height were measured at baseline and after 12 months.

**Results:** Twelve months after the sports camp the intervention group had a significant decrease in BMI SDS (baseline BMI SDS 3.21; follow up BMI SDS 3.10, p=0.02). The control group also decreased their BMI SDS (baseline BMI SDS 3.27; follow up BMI SDS 3.19, p=0.02). There were no differences within and between groups, as well as with gender.

**Conclusions:** The intervention focus on physical activity had not effect on the degree of obesity as compared to an untreated control group. This could imply that family needs to be part of the program.

**Funding:** Research related to this abstract was funded in part by Swedish Savings Bank Foundations, the Swedish Sports Association and Östra Göinge municipality.

## T2:PS:49

**The acute effects of a lunch containing resistant starch on energy and substrate utilization, ghrelin, glucagon-like peptide-1, PYY concentrations, and satiety**Smeets, A.J.P.G.<sup>1,2</sup>, Gelencser, T.<sup>3</sup>, Salgo, A.<sup>3</sup> and Westerterp-Plantenga, M.S.<sup>1,2</sup><sup>1</sup> Maastricht University, Department of Human Biology, Nutrition and Toxicology Research Institute Maastricht (NUTRIM), P.O. Box 616, 6200 MD, Maastricht, The Netherlands.<sup>2</sup> Top Institute Food and Nutrition, P.O. Box 557, 6700 AN, Wageningen, The Netherlands.<sup>3</sup> Technical University of Budapest, Department of Biochemistry and Food Technology, Budapest, Hungary.

Observations of epidemiological studies indicate that dietary fibre intake is involved in body weight control. A dietary fibre component that may be of specific importance is resistant starch (RS). Acute effects of RS on energy expenditure and substrate oxidation have hardly been studied. In addition, the effects of RS on ghrelin, PYY and GLP-1, in relation to changes in hunger and satiety are unknown.

Thirty subjects (age: 31±14y, BMI: 23.8±2.8kg/m<sup>2</sup>) were studied 2 times in a randomized controlled crossover design. After 30 minutes resting on a bed, resting metabolic rate was measured by a ventilated hood system. Subsequently lunch (35% of daily energy intake) was served. The two lunch conditions were: i) normal pasta and ii) resistant starch pasta. The macronutrient composition (energy %) of the lunches was: 60% carbohydrates/ 10% protein/ 30% fat. During 3 hours after the lunch diet induced energy expenditure (DEE) was measured. Furthermore anchored 100mm visual analogue scales on the appetite profile were collected before the lunch and after the lunch, and blood samples were taken for analysis of GLP-1, PYY, and ghrelin concentrations, before and at different time points after the lunch. Satiety and energy expenditure were not different after RS lunch compared with the control lunch. Ghrelin, GLP-1 and PYY responses were not different between the RS lunch and the control lunch.

In conclusion, RS supplementation has no acute effect on substrate utilisation appetite feelings and gut derived hormones.

The study was funded by DiOGenes (Contract no. FP6-513946) which raises no potential duality of interest.

## T2:PS:48

**Thermogenic effects of  $\alpha$ -lipoic acid: differential impacts on body composition during growth and catch-up growth**

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$\alpha$ -lipoic acid, a widely marketed dietary supplement with potent anti-oxidant properties, has been reported to possess anti-diabetogenic and anti-obesity (leptin-like) properties in rodents. We investigated whether the reported thermogenic properties of  $\alpha$ -lipoic acid could be of value in preventing excess body fat accretion in response to high-fat consumption during normal (spontaneous) growth or during catch-up growth after caloric restriction.

Studies of energy balance and body composition were conducted for 2 wks in groups of Sprague-Dawley rats which were either fed or semistarved-refed on a high-fat lard diet - with subgroups consuming isocaloric diets that were supplemented or not with  $\alpha$ -lipoic acid (0.25%).

The results indicate that  $\alpha$ -lipoic acid supplementation resulted in significant attenuation of weight gain (-20%, p<0.01) both during spontaneous growth and during catch-up growth. Analysis of data on energy balance and body composition however reveal that the increases in energy expenditure with  $\alpha$ -lipoic acid resulted in a lower gain both in fat mass and in lean body mass in the spontaneously growing (fed) group. In the refed groups showing catch-up growth, by contrast, the increases in energy expenditure with  $\alpha$ -lipoic acid resulted entirely in a lower gain in lean body mass, without alterations in the high rate of fat deposition.

These studies indicate that the stimulatory effects of  $\alpha$ -lipoic acid on energy expenditure lead to differential effects on body composition during growth and catch-up growth, and underscore the need for human studies that would address the potential effects of this widely marketed dietary supplement as a protein catabolizer.

## T2:PS:50

**The acute effects of a lunch containing capsaicin on energy and substrate utilization, hormones, and satiety**Smeets, A.J.P.G.<sup>1,2</sup> and Westerterp-Plantenga M<sup>1,2</sup><sup>1</sup> Maastricht University, Department of Human Biology, Nutrition and Toxicology Research Institute Maastricht (NUTRIM), P.O. Box 616, 6200 MD, Maastricht, The Netherlands.<sup>2</sup> Top Institute Food and Nutrition, Wageningen, The Netherlands.

**Background:** Addition of capsaicin to the diet has been shown to increase satiety and thermogenesis. The effects of capsaicin on ghrelin, PYY and GLP-1, in relation to changes in hunger and satiety are unknown.

**Methods:** Thirty subjects (age: 31±14y, BMI: 23.8±2.8kg/m<sup>2</sup>) were studied 2 times in a randomized controlled crossover design. After 30 minutes resting on a bed, resting metabolic rate was measured by a ventilated hood system. Subsequently lunch (35% of daily energy intake) was served. The two lunch conditions were: i) lunch without capsaicin and ii) lunch with capsaicin (CAPS). The macronutrient composition (energy %) of the lunches was: 60% carbohydrates/ 10% protein/ 30% fat. During 3 hours after the lunch diet induced energy expenditure was measured. Furthermore anchored 100mm visual analogue scales on the appetite profile were collected and blood samples were taken for analysis of GLP-1, PYY, and ghrelin concentrations, before and at different time-points after lunch.

**Results:** Satiety and energy expenditure were not different after CAPS lunch compared with the control lunch. Fifteen minutes after lunch CAPS lunch increased GLP-1 (p<0.05) and tended to decrease ghrelin (p=0.07) compared with the control lunch. PYY responses were not different between the CAPS lunch and the control lunch.

**Conclusion:** Acute lunch containing capsaicin had no effect on satiety, EE, and PYY, but increased GLP-1 and tended to decrease ghrelin.

The study was funded by DiOGenes (Contract no. FP6-513946) which raises no potential duality of interest.

## T2:PS:51

**Is iron status in dieting pre-menopausal women affected by red meat consumption?**Leslie WS<sup>1</sup>, Gilmour H<sup>2</sup>, Lean MEJ<sup>1</sup>, Hankey CR<sup>1</sup><sup>1</sup>University of Glasgow Department of Human Nutrition, Glasgow Royal Infirmary, Glasgow, UK<sup>2</sup>University of Glasgow Department of Public Health and Health Policy, 1 Lilybank Gardens, Glasgow, UK.

**Introduction:** Iron deficiency is a major global public health problem and common in the UK especially in young women. Habitual dieting can deplete iron stores. Women often specifically exclude red meat while slimming, which has potential implications for iron status.

**Aim:** To determine the effect on iron status (serum ferritin) of a weight management programme (12 weeks weight loss & 12 weeks weight maintenance), which included the regular consumption of lean red meat compared to one that excluded it.

**Methods:** A randomised controlled trial of 36 overweight, pre-menopausal women, mean serum ferritin 15.8 (SD 3.1) ug/l. Dietary advice was delivered using a one-to-one approach with review every two weeks.

**Results:** Thirty women completed the study. Weight loss at week 12 was -2.8 (SD1.9) kg,  $p<0.0001$  (meat), -2.6 (SD 2.4) kg,  $p<0.0001$  (no meat).

Serum ferritin improved in both diet groups at wk 24 and was significant for the groups combined +3.24 (SD 9.02) ug/l  $p=0.03$ . There was some suggestion ( $p=0.07$ ), that in women consuming meat, better adherence to dietary advice, with greater weight loss, led to greater improvements in serum ferritin

**Conclusion:** The data, although inconclusive, suggest better iron status with regular consumption of red meat. A larger study with greater weight loss is required for definitive health promotion advice. Including red meat provides variety and a rich source of dietary iron and should be an option in any weight management programme.

**Funding:** This study was funded by the Meat and Livestock Commission.

## T2:PS:53

**Impact of Diabetic Nephropathy on Initial Response (6-weeks) to Sibutramine Treatment: A Preliminary Analysis of the Sibutramine Cardiovascular Outcomes (SCOUT) Trial**Finer, N<sup>1</sup>, Van Gaal, L<sup>2</sup>, Caterson, I<sup>3</sup>, Coutinho, W<sup>4</sup>, Maggioni, A<sup>5</sup>, Sharma, AM<sup>6</sup>, Torp-Pedersen, C<sup>7</sup>, and James, WPT<sup>8</sup>, on behalf of the SCOUT Investigators<sup>1</sup>Wellcome Trust Clinical Research Facility, Cambridge University, Cambridge, UK<sup>2</sup>University Hospital of Antwerp, Belgium<sup>3</sup>University of Sydney, Australia<sup>4</sup>Catholic University of Rio de Janeiro, Brazil<sup>5</sup>ANMCO Research Center, Florence, Italy<sup>6</sup>University of Alberta, Edmonton, Alberta, Canada<sup>7</sup>Bispebjerg University Hospital Copenhagen, Denmark<sup>8</sup>London School of Hygiene and Tropical Medicine, London, UK

**Introduction:** Weight loss and blood pressure (BP) reduction for obese patients at high cardiovascular (CV) risk are important treatment goals but more difficult to achieve with concomitant diabetic nephropathy (DN). Benefits of strict BP control (<125/75 mmHg) to inhibit further renal function decline are well recognized. This analysis examines body-weight and vital-sign changes in the SCOUT high-CV-risk population during the 6-week lead-in period when all patients received sibutramine (SIB) 10 mg plus weight management.

**Patients and Methods:** Eligible patients included those with type 2 diabetes mellitus (DM) plus history of DN evidenced by microalbuminuria. Of 10,742 patients treated during the lead-in period, 7% were categorized as DM+DN, 76% as DM+no DN and 16% as non-DM.

**Results****Median Changes at End of 6-Week Lead-In Period by History of Diabetic Nephropathy (LOCF analysis)**

	DM+DN patients (n=773)	DM+no DN patients (n=8208)	Non-DM patients (n=1761)
Initial body weight (kg)	94.7	95.0	93.5
Change (kg)	-2.0	-2.1	-2.5
(%)	-2.2	-2.3	-2.6
Initial SBP/DBP (mmHg)	140.5/78.0	139.5/79.0	137.5/79.5
Change (mmHg)	-3.5/-0.5	-3.5/-1.0	-2.5/-0.5
Initial heart rate (bpm)	72.0	71.0	67.5
Change (bpm)	2.0	1.5	2.0

**Conclusion:** Patients at high risk for CV events, with DM and concomitant DN were not resistant to treatment with SIB for 6 weeks; similar decreases in weight and BP were evident as in DM patients without DN, indicating the value of treatment in this group of patients. Non-DM patients lost more weight but with a smaller fall in SBP. All groups had small increases in heart rate.

**Conflict of Interest:** Payment received from Abbott Laboratories for participation in the Executive Steering Committee of the SCOUT study.

**Funding:** Research relating to this abstract was funded by Abbott Laboratories.

## T2:PS:52

**Non-Surgical Weight Loss- Use of water-filled Intra-gastric Balloons.**Marks SJ<sup>1</sup>, Merrett MN<sup>2</sup>, Counsel S<sup>2</sup>, and Strauss BJJ<sup>1</sup><sup>1</sup>Clinical Nutrition and Metabolism Unit, Monash Medical Centre, Melbourne, Australia<sup>2</sup>Frankston Private, Melbourne, Australia

Since 2001 we have endoscopically inserted 92 water-filled intra-gastric balloons (BioEnteric Intra-gastric Balloon BIB™) into 73 obese patients (63 F, 10 M) unable to lose weight using reduced fat diets, exercise, VLCD, sibutramine or orlistat. In many patients, relatively rapid weight loss was indicated prior to hip replacement or back surgery.

In the initial 3 years we experienced spontaneous deflation in 13 balloons. There were no further deflations in the subsequent 3 years. Most deflated balloons remained in the stomach and were removed endoscopically. Seventy-nine (79) balloons were fully inflated at removal from 73 patients.

In the total patient group including deflated/faulty balloons,  $n = 92$ , mean weight loss was **10.5 kg ( $p<0.0001$ )**. There were no bowel obstructions despite 4 deflated BIBs transiting the bowel. In the intact BIB™ patients (full inflation at removal,  $n = 79$ , age  $42.0 \pm 1.4$  years, mean insertion BMI  $41.9 \pm 1.0$  kg/m<sup>2</sup>, mean duration  $196.2 \pm 9.2$  days), mean weight loss was **11.0 kg ( $p<0.0001$ )**. In this group, 12 BIBs (15.1%) were removed prematurely due to either intractable vomiting (7), nausea (1), belching (2), prior to emergency surgery (1), or at the patient's request (1).

The BIB™ procedure is a safe, low-risk intervention producing a moderate weight loss in weight-loss resistant obese patients.

## T2:PS:54

**Impact of Congestive Heart Failure on Initial Weight Loss with Sibutramine Treatment: A Preliminary Analysis of the Sibutramine Cardiovascular Outcomes (SCOUT) Trial**Sharma, AM<sup>1</sup>, Caterson, I<sup>2</sup>, Coutinho, W<sup>3</sup>, Finer, N<sup>4</sup>, Van Gaal, L<sup>5</sup>, Maggioni, A<sup>6</sup>, Torp-Pedersen, C<sup>7</sup>, and James, WPT<sup>8</sup>, on behalf of the SCOUT Investigators<sup>1</sup>University of Alberta, Edmonton, Alberta, Canada; <sup>2</sup>University of Sydney, Australia; <sup>3</sup>Catholic University of Rio de Janeiro, Brazil; <sup>4</sup>Wellcome Trust Clinical Research Facility, Cambridge University, Cambridge, UK; <sup>5</sup>University Hospital of Antwerp, Belgium; <sup>6</sup>ANMCO Research Center, Florence, Italy; <sup>7</sup>Bispebjerg University Hospital, Copenhagen, Denmark; <sup>8</sup>London School of Hygiene and Tropical Medicine, London, UK

**Introduction:** Obesity is an accepted risk factor for increased cardiovascular (CV) risk. The "obesity paradox," decreasing mortality with increasing body mass index (BMI) has been suggested in patients with congestive heart failure (CHF). Its validity is questioned in relation to intentional weight loss and degree of obesity.

Patients with CHF (NYHA Class I/II only) were eligible for the SCOUT trial, which is assessing the impact of weight management on CV outcomes in high-CV-risk patients. All received sibutramine (SIB) 10mg with weight management during a 6-week lead-in period before randomization into the long-term, double-blind phase. This analysis compares the response of obese patients with or without CHF to short-term weight management.

**Patients and Methods:** Eligible patients were overweight or obese with CV risk factors. Of 10,742 patients treated in the lead-in period, approximately 900(8.5%) reported a history of CHF treated with medication.

**Results****Median Changes at End of 6 Weeks (LOCF analysis)**

	CHF patients (n=913)	Non-CHF patients (n=9829)
Initial body weight (kg)	95.8	94.7
Change (kg)	-2.2	-2.2
(%)	-2.5	-2.3
Initial BMI(kg/m <sup>2</sup> )	33.8	33.8
Change(kg/m <sup>2</sup> )	-0.8	-0.8
Initial SBP/DBP(mmHg)	136.0/77.3	139.5/79.0
Change(mmHg)	-4.0/-1.0	-3.0/-0.5
Initial heart rate(bpm)	70.5	71.0
Change(bpm)	1.0	2.0

**Conclusion:** In patients at high risk for CV events, median weight loss was similar in both groups. CHF patients had slightly greater falls in BP and smaller increases in heart rate. The CHF group requires careful monitoring to determine if this selected risk is associated with additional benefits or hazards over the long term.

**Conflict of Interest:** Payment received from Abbott Laboratories for participation in the Executive Steering Committee of the SCOUT study.

**Funding:** Research relating to this abstract was funded by Abbott Laboratories.

## T2:PS:55

**Comparison of kidney and liver changes after 3 months of a low carbohydrate vs. a very low calorie diet.**Hession, M<sup>1</sup>, Rolland, C<sup>1</sup>, John, O<sup>1</sup>, Murray, S<sup>2</sup>, Wise, A<sup>1</sup>, Broom, J<sup>1</sup>.<sup>1</sup>Robert Gordon University, Aberdeen, Scotland; <sup>2</sup>LighterLife, Harlow, UK.

Long term efficacy of low carbohydrate and very low calorie diets and their effects on liver and kidney function are still uncertain.

A randomized control trial is in progress to assess weight and cardiovascular risk factors with 3 diets: 1. a healthy eating/low calorie diet (HE). 2. a very low calorie diet (LighterLife-LL) and 3. a protein sparing modified fast (PSMF).

120 patients underwent a screening process for 3 months in which they consumed HE. Patients who achieved a 5% weight loss at 3 months remained on HE. Patients who did not achieve 5% weight loss were randomized to LL or PSMF.

Data presented here are for 3 months post-randomization.

72 patients were randomized (LL, n= 35 and PSMF, n =37).

From baseline to 3 months post-randomization, urea decreased (-0.53 mmol/L SD 1.4) on LL but increased on PSMF (+0.63 mmol/L SD 1.8), whereas albumin increased (+0.41 g/L SD 1.7) on LL but decreased on PSMF (-0.05 g/L SD 2.1). The changes over 3 months differed significantly between the diets. No differences were found for all other analytes: sodium, potassium, chlorine, creatinine, alanine aminotransferase, alkaline phosphatase and gamma glutyl transferase.

Although there were differences for urea and albumin 3 months post randomization between the diets, there were no differences found for all other analytes, this may indicate that neither diet causes adverse effects on liver and kidney function. More long term results need to be obtained before this can be concluded.

## T2:PS:57

**The not so different body dissatisfaction in boys and girls**Franklin, J<sup>1,2</sup>, Booth, M<sup>2</sup>, Denyer, G<sup>2</sup>, Steinbeck, KSS<sup>1</sup>, Caterson, IDC<sup>2</sup>, Hill, AJ<sup>3</sup><sup>1</sup>Royal Prince Alfred Hospital, Sydney, Australia; <sup>2</sup>University of Sydney, Sydney, Australia; <sup>3</sup>University of Leeds, Leeds, UK

**Aims:** Body dissatisfaction (BD) has long-been thought to affect mainly females but evidence is accumulating that boys are experiencing dissatisfaction even before adolescence. The study aims were to determine the prevalence and character of pre-adolescent BD, and its associations with sex and BMI categories.

**Methods:** A primary school-based, state-wide, cross sectional survey of children's eating habits, physical activity and psychosocial status in New South Wales, Australia, that included figure rating scale choices of current and preferred body shape. Participant N=2813 and mean age=11.2 yrs.

**Results:** Boys and girls on average chose a similar figure for current body shape, but girls desired a thinner body shape (TBS) than boys. There was only a marginal difference between the sexes for mean degree BD (disregarding direction of desire). 42.9% and 54.6% of boys and girls respectively desired a TBS and 14% and 7.1% of boys and girls respectively desired a fatter body shape. As weight increased so did BD, with 88.9% and 97.1% of obese boys and girls respectively desiring a TBS and over 60% of the obese children reported extreme BD. Obese boys were 17.6 (95%CI 6.8-46.0) and obese girls were 35.7 (95%CI 9.0-140.6) times more likely to report desiring a TBS.

**Conclusions:** BD is very common in preadolescents. Boys once thought to be immune to BD and in particular a desire for thinness, are now reporting levels similar to girls. Obese children are particularly vulnerable to BD which may be damaging at a time when their sense of self is developing.

This research was funded by the National Health and Medical Research Council of Australia.

## T2:PS:56

**Subjects with sleep related breathing disorders increased dietary saturated fat and energy density during treatment with orlistat**Svendsen, M<sup>1</sup>, Tonstad, S<sup>1</sup>.<sup>1</sup>Department of Preventive Cardiology, Ullevål University Hospital, Oslo, Norway.

**Aims:** We studied the effect of orlistat on the maintenance of dietary changes and predictors of weight loss in patients with sleep related breathing disorders (SRBD).

**Methods:** Men and women with SRBD aged 32-62 years (n=63) participated in a 3-month dietary intervention program. After an initial weight loss of 3.0% mean (SD) BMI was 34.6 (4.7) kg/m<sup>2</sup>. Thereafter, they were treated with orlistat for one year and dietary and behavioural interventions were provided in the course of 14 group sessions. Dietary intake was assessed with a food frequency questionnaire before and after orlistat treatment.

**Results:** After one year, body weight decreased by 3.5 kg (P=0.0012). E% saturated fat, intake of fatty dairy products and energy density increased (1.2% [95% CI 0.4, 2.0], 11 g/day [95% CI 1, 21], 0.5 g/kJ [95% CI 0.2, 0.7], respectively). The intake of fish decreased (-10 g/day [95% CI -19, -1]), as did E% monounsaturated fat, E% carbohydrate and dietary fibre. After adjustment for age, gender, baseline BMI, and attendance rate, weight loss was associated with higher E% protein (R<sup>2</sup><sub>adj</sub>=0.176 [95%CI 0.080, 0.434]) and fish (R<sup>2</sup><sub>adj</sub>=0.167 [95%CI 0.072, 0.427]) and lower E% saturated fat (R<sup>2</sup><sub>adj</sub>=0.179 [95%CI 0.080, 0.434]), fatty meats (R<sup>2</sup><sub>adj</sub>=0.117 [95%CI 0.043, 0.378]) and fatty dairy products (R<sup>2</sup><sub>adj</sub>=0.200 [95%CI 0.093, 0.456]), but not with energy density.

**Conclusion:** Treatment with orlistat for one year induced further weight reduction after an initial diet alone induced weight loss, but dietary composition deteriorated despite a behavioural treatment program. Increased protein and lower saturated fat intakes were associated with better weight loss.

**Funding:** This study was sponsored by Roche Norway AS.

## T2:PS:58

**Endocrinological evaluation of obese patients (op) scheduled for bariatric surgery (bs)**

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BS allows a stable body weight reduction in morbidly OP. Aim of this study was to evaluate the prevalence of endocrine disorders in a series of OP before BS. We studied 495 OP (393 F, 102 M; age 18-70 years, mean±SD 44±12; BMI 35-91 Kg/m<sup>2</sup>; mean±SD 45.7±8.4). Thyroid, parathyroid and pituitary function was evaluated; hypercortisolism was diagnosed by an overnight 1 mg dexametasonone suppression test. Thyroid ultrasound and fine-needle aspiration biopsy were performed when indicated. 5 OP had an undiagnosed Cushing syndrome: 3 had a Cushing disease due to a pituitary adenoma, and 2 had an hypercortisolism due to an adrenal adenoma. 119 OP had a multinodular goiter (43 newly diagnosed). 1 medullary and 1 papillary thyroid cancer were discovered. The prevalence of autoimmune thyroiditis was 88/495 OP (67 with hypothyroidism under L-T4 therapy, 5 with untreated hypothyroidism). 1 patient was hypothyroid after treatment with amiodarone. 16 OP were under L-T4 therapy after thyroidectomy for papillary thyroid cancer, Graves' disease or toxic multinodular goiter. 4 OP had an unknown primary hyperparathyroidism. The pituitary hormonal screening revealed 1 hyperprolactinemic man with a non-functioning pituitary adenoma causing hypothalamic disconnection, and 1 central hypogonadism due to an empty sella. The overall prevalence of endocrine dysfunctions requiring specific treatment before BS was 104/495 (21%). In conclusion, a careful endocrinological evaluation of OP before BS should be advised. This may reveal undiagnosed dysfunctions that require specific treatment and/or contraindicate bariatric surgery, and allows proper adjustment of hormonal therapy in patients with previously diagnosed endocrine diseases.

## T2:PS:59

**Getting the balance right – a pragmatic community intervention programme for overweight/obese children in Gateshead.**

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<sup>1</sup>Gateshead Health Foundation Trust, Tyne and Wear, UK; <sup>2</sup>Gateshead Primary Care Trust, Tyne and Wear, UK; <sup>3</sup>Gateshead Council, Tyne and Wear UK.

**Aims:** In Gateshead, a quarter of 10-11 year olds are overweight or obese. *Getting the Balance Right* is a holistic intervention aimed at tackling this problem in school aged children, specifically, aiming to improve Body Mass Index (BMI) in children completing the pathway of care for a twelve month period.

**Methods:** After inter-disciplinary consultation, between health, social services and leisure services locally, a pathway of care was developed to identify and assess children who were overweight or obese. Personalised programmes of nutritional and behavioural advice and physical activity were offered to children and families. School health advisors or dietitians did initial assessments; paediatricians reviewed children thought to have underlying medical conditions and all children received coaching by a trained leisure worker. All data are quoted as means. BMI adult equivalent (Adeq) and BMI standard deviation scores (SDS) are given.

**Results:** Over 30 months, 231 children with a BMI\_Adeq of 28.9±5.8 and BMI\_SDS of 3.0±0.7 entered the programme. One hundred and seventy-five (11.4±3.3 years, 59% female and 78% obese) attended four dietetic appointment over 6.6±3.1 months and BMI\_Adeq decreased by 0.9±1.7 and BMI\_SDS by 0.14±0.25 (both p<0.0001). A significant decrease in BMI was maintained and 20 children, who still had not been discharged from dietetic review, attended their ninth appointment at 14.9±3.6 months, when BMI\_Adeq had decreased by 1.8±3.1 and BMI\_SDS by 0.27±0.44 (p<0.01).

**Conclusion:** Our pragmatic intervention was a partnership between the PCT, Hospital Foundation Trust and the council. It has uniquely produced a sustained and significant improvement in BMI in a large cohort. The results compare favourably with other shorter, smaller-scale interventions and other community projects<sup>1,2</sup>. Our approach could be used in other areas as a strategy to combat the rise in childhood obesity.

**Funding:** We are grateful to Gateshead Council and the Dept of Health for funding this project through a local public service agreement. There are no conflicts of interest to disclose.

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## T2:PS:61

**Obesity and chronic kidney disease incidence in adult women: Tehran Lipid and Glucose Study**

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**Background:** Epidemiological data comparing different aspects of obesity in predicting CKD in a cohort are limited.

**Objective:** We examined the association between BMI and CKD incidence and compared it with other anthropometrical measurements to define best predictor of CKD in women.

**Methods:** In this population-based cohort study, a representative sample of 2498 women, older than 18 years of age, free of CKD at baseline, were followed for 3.5 years. We estimated GFR by using the abbreviated equation from the Modification of Diet in Renal Disease Study and defined CKD as GFR less than 60 mL/min/1.73m<sup>2</sup>. Multivariate logistic regression was used to examine the relation between the baseline anthropometrical measures and CKD incidence.

**Results:** Mean BMI of our participants at baseline was 27±5kg/m<sup>2</sup>. After 3.5 years CKD developed in 148 (5.3%) of participants. Higher baseline BMI was associated consistently with increased incidence of CKD. The incidence of CKD in, normal BMI (≤25), overweight (25.1 to 30) and obese (≥31.1 kg/m<sup>2</sup>), were 3.2, 8.1, and 10.8% respectively. The crude ORs for having CKD across normal, overweight and obese women categories were 1.00 (reference), 2.67 (1.71-4.17) and 3.66 (2.34-5.78), respectively, (p for trend<0.01). After adjustment for age, smoking, baseline blood pressure, baseline diabetes, change in BMI, waist and WHR, the odds ratios for CKD incidence were 1.00 (reference), 1.68 (0.95-2.96) and 1.75 (0.86-3.57), respectively; (P for trend<0.05). Waist and WHR were excluded from the model. Similar results were noted after exclusion of participants with baseline diabetes mellitus.

**Conclusion:** BMI, but not waist and WHR, is an independent, strong, and potentially modifiable risk factor for CKD in women. Weight loss might represent a novel intervention to reduce risk of CKD development and progression.

## T2:PS:60

**Which pre-operative factors predict adequate weight loss following laparoscopic gastric band insertion?**

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**Introduction:** Laparoscopic gastric band insertion (LGBI) is being performed more frequently, but not all patients achieve adequate weight loss. This study aimed to analyse whether weight at initial assessment, age, gender, pre-operative weight loss or device type predicted total post-operative weight loss.

**Methods:** A retrospective analysis was performed on data on LGBI patients attending a regional bariatric centre over 3 years. Patients were operated on if BMI>35kg/m<sup>2</sup> with an associated co-morbidity, or BMI>40kg/m<sup>2</sup> without. All received professional dietary advice pre-operatively, and pre-operative calorie restriction of 900kcal for 2 weeks prior to surgery. Devices used included the Lap-Band<sup>™</sup>, Swedish adjustable band, or Heligasi<sup>™</sup> device.

**Results:** There were 246 consecutive patients analysed: 197 female (80%), median age 42y (IQR 36-49); 49 male, median age 49y (IQR 45-55). Mean waiting time between initial assessment and LGBI insertion was 7.8 months. Median post-operative follow-up was 16 months. Initial assessment weight significantly correlated with pre-LGBI weight loss (p<0.0001, Spearman). Patients with BMI ≥50kg/m<sup>2</sup> (n=75) lost 6.4±1.0kg before the LGBI, compared to a weight loss of 2.1±0.5kg pre-LGBI in patients with a lower BMI (n=109). Pre-LGBI weight loss correlated with post-LGBI weight loss (p=0.016, Spearman). Post-operative weight loss was not correlated with age, gender or device used.

**Conclusions:** Patients with high assessment BMI, and those with greatest weight losses pre-LGBI appear to achieve greater post-LGBI weight loss. It appears that pre-operative diet predicts post-LGBI compliance and thus weight loss.

## T2:PS:62

**A randomized controlled trial on the effect of dietary advice on gestational weight gain in obese pregnant women: preliminary results**

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Maternal obesity is a major risk factor for obstetric complications including gestational diabetes, hypertensive complications and operative delivery. Excessive gestational weight gain (GWG) further increases these risks. The optimal follow-up to reduce GWG in these patients is not known. We therefore randomised obese pregnant women (age: 29 ± 4 years; BMI: 33.5 ± 4.01 g/m<sup>2</sup>) in 2 intervention groups: one group receiving nutritional advice through a purpose-designed brochure (A) and one group additionally receiving active lifestyle education (B). The hypothesis is that nutritional advice through a brochure or active education results in reduced GWG. Nutritional habits were evaluated every trimester by means of three 7-day food records and compared with a control group (C).

Preliminary results in obtained in 99 obese pregnant women demonstrate that dietary habits at the start of the study did not reach recommended values, but were comparable between the groups. After the intervention, total energy intake was lower in groups A and B than in the controls (p=0.033). This effect was mainly due to a decreased fat intake in the 2 intervention groups versus control group (p=0.008). There were no significant differences in mean (SD) GWG between the three groups (11±7 vs 10±6 vs 10±7 kg). Birth weight of the babies was comparable. These preliminary results show that nutritional advice improves dietary habits of obese women (reduced energy and fat intake), but had no significant effect on GWG or birth weight.

## T2:PS:63

**Fat oxidation rate and blood lactate accumulation during walking and cycling in severely obese adolescents**Lazzer, S<sup>1,3</sup>, Busti, C<sup>1</sup>, Galli, R<sup>1</sup>, Agosti, F<sup>1</sup>, De Col, A<sup>1</sup>, Lafortuna, C<sup>4</sup> and Sartorio, A<sup>1,2</sup><sup>1</sup>Experimental Laboratory for Auxo-Endocrinological Research and <sup>2</sup>Division of Auxology, Italian Institute for Auxology, IRCCS, Milan and Verbania, Italy<sup>3</sup>Department of Biomedical Sciences and Technologies, University of Udine, Italy<sup>4</sup>Institute of Bioimaging and Molecular Physiology, CNR, Milan, Italy

The objectives of the present study were to identify 1) the exercise intensity that elicits the maximum fat oxidation rate during walking and cycling and 2) the intensity at which the lactate concentration starts to accumulate in plasma.

Fifteen obese boys (mean BMI: 37.6 kg/m<sup>2</sup>; fat-mass: 38.6%), aged 13 to 17 years, participated in this study. Body composition was assessed by bioelectrical analysis. Subjects performed a graded exercise test on a cycle-ergometer and on a motorised treadmill. Peak oxygen uptake and maximal fat oxidation rate were determined by indirect calorimetry and stoichiometric equations were used to calculate fat oxidation rate. Blood samples for lactate analyses were collected at the end of each stage of the graded exercise test.

The exercise intensity, which elicits maximal fat oxidation, corresponded to (mean±SD) 39±4% V<sub>O</sub>max, or 55±6% HR<sub>max</sub>, without significant differences between walking and cycling. At this exercise intensity, fat oxidation rate was higher during walking than cycling (0.48±0.04 vs 0.30±0.05 g/min, p<0.001). The intensity at which lactate concentration increased above baseline corresponded to 40 ±3% V<sub>O</sub>max for walking and cycling. However, at this exercise intensity, lactate concentration was lower during walking than cycling (1.2±0.3 vs 1.8±0.4 mmol/L, p<0.001).

In conclusion: i. maximal fat oxidation rate was reached at the same exercise intensity for both walking and cycling; ii. fat oxidation rate was 37% higher during walking than cycling at 55% V<sub>O</sub>max; iii. accumulation of plasma lactate was strongly correlated with the reduction in fatty acid oxidation with increasing exercise intensities; iv. lactate accumulation was lower during running than cycling.

**Funding:** Research relating to this abstract was funded by Progetti di Ricerca Corrente, Italian Institute for Auxology, Milan, Italy.

## T2:PS:65

**Emotional, cognitive and situational antecedents and consequences of binge eating assessed by electronic diaries before and after a short-term CBT for BED**Munsch, S<sup>1</sup>, Meyer, A H<sup>1</sup>, & Wilhelm, F<sup>1</sup><sup>1</sup>Department of Clinical Psychology and Psychotherapy, Faculty of Psychology, University of Basel

**Objectives:** To identify antecedents and consequences of binge eating before and after short-term CBT in BED based on Ecological Momentary Assessment (EMA).

**Methods:** Twenty-eight individuals were randomly allocated to an immediate treatment or to a wait-list condition. Binge eating was studied according to EMA (seven days) at the beginning of wait-list condition, before and after treatment.

**Results:** Before treatment, interpersonal conflicts, negative mood, or situational triggers such as evening time or specific weekday most often triggered binge eating. After binge eating, cognitions regarding low self-efficacy were most prominent. After treatment analyses the same antecedents and consequences were associated with the few binges still exhibited.

**Conclusion:** EMA based assessments show before and after CBT that most often, binge eating is triggered by interpersonal conflicts and negative mood. Further situational aspects, play a major role in triggering binges. After binge eating cognitions regarding low self-efficacy in dealing with the problem dominate. These findings might help tailoring treatment protocols to specific BED patients populations.

**Funding:** The Study was funded by the Freiwillige Akademische Gesellschaft (FAG) of Basel

## T2:PS:64

**Changes in regional fat composition as assessed by mr and dxa Scan during a dietary induced weight loss**Gasteyer, C<sup>1</sup>, Larsen TM<sup>1</sup>, Toubro S<sup>2</sup>, Astrup, A<sup>1</sup>.<sup>1</sup>Department of Human Nutrition, Faculty of Life Sciences, University of Copenhagen, Frederiksberg, Denmark<sup>2</sup>Reduce, Research Clinic of Human Nutrition, Hvidovre University Hospital, Copenhagen, Denmark

**Background:** Data on the regional fat composition of a body weight change are limited.

**Methods:** We assessed changes in visceral (VAF) and subcutaneous (SAF) abdominal fat at L4-L5 level by MR and changes in body composition (including trunk fat mass) by DXA scans in 112 obese subjects (26 men and 86 women) before and after an 8 week low-calorie diet with 800-1000 kcal/day.

**Results:** The mean body weight loss was 11.3% (SD 2.7) in men and 10.3% (1.9) in women (p=0.04). A weight loss of 10% produced a body fat loss of 15% (95% CI 14-16), a reduction in SAF of 14% (12-16) and a reduction in VAF of 20% (16-25). Relative changes in VAF and SAF were significantly correlated with changes in trunk fat mass (r=-0.45; p<0.001 and r=-0.44; p<0.001, respectively). After correction for relative changes in trunk fat mass, the relative reduction in VAF was 34% (28-39) in men and 21% (18-24) in women (p<0.001). Relative changes in SAF did not differ significantly between men and women (p=0.85) after correcting for relative changes in trunk fat mass.

**Conclusion:** For a given percentual reduction in body weight, the accompanying reduction in visceral fat is about twice that size (10 versus 20 %), which is consistent with the visceral fat deposition being easier mobilizable. However, for any weight loss compound claiming a selective effect on visceral fat it is not enough to demonstrate that greater percentage of visceral fat than body weight is lost.

**Funding:** Research relating to this abstract was funded by Johnson & Johnson Pharmaceutical Research and Development as well as by the Center for Pharmacogenomics, University of Copenhagen.

## T2:PS:66

**Electronic diaries to evaluate efficacy of a Cognitive Behavioral Treatment for BED**Munsch, S<sup>1</sup>, Milenkovic, N<sup>1</sup>, Meyer, A H<sup>1</sup>, Schlup, B<sup>1</sup>, Margraf, J<sup>1</sup> & Wilhelm, F<sup>1</sup><sup>1</sup>Department of Clinical Psychology and Psychotherapy, Faculty of Psychology, University of Basel

**Objectives:** To explore feasibility of Ecological Momentary Assessment (EMA) in evaluating a short-term CBT.

**Methods:** Twenty-eight individuals were randomized to an immediate short-term CBT (8 weeks) or to a wait-list condition (8 weeks). EMA was accomplished during seven days at the beginning of wait-list condition, before and after treatment.

**Results:** Ratings of acceptance and compliance with EMA were high. EMA-based estimates of bingeing were lower than rates assessed by retrospective questionnaires or interviews. Binges assessed by EMA were significantly reduced from 2.75 to 0.5 per week. Craving, feelings of hunger and control remained stable.

**Conclusion:** EMA was well accepted and patients adhered to the EMA-protocol. We find indices of retrospective memory distortion regarding questionnaire and interview based assessment of binge eating. Short-term CBT is efficacious in reducing binge eating, whereas EMA shows, that feelings of loss of control, hunger, craving remain stable. Binge eating may be the tip of the iceberg, which can be remitted in CBT, but craving and reduced feelings of control might represent more stable aberrations of impulse control.

**Funding:** The Study was funded by the Freiwillige Akademische Gesellschaft (FAG) of Basel

## T2:PS:67

**Effect of different duration and weight loss targets of Low Energy Liquid Diet including sibutramine programme on weight loss maintenance in obese patients**Helmy A<sup>1</sup>, Ruparelia R<sup>1</sup>, Young L<sup>1</sup>, Finer N<sup>1,2</sup><sup>1</sup>Centre For Obesity Research, Luton, UK; <sup>2</sup>Institute for Metabolic Science- Metabolic Science Laboratories, Cambridge, UK

Low Energy Liquid Diets (LELD 800-1200 Kcal/day = 3.35-5.02 MJ) have proved an effective strategy for weight loss induction, and weight loss maintenance over 1-3 years. The addition of pharmacotherapy improves weight loss maintenance. The optimal duration of LELD for subsequent weight loss maintenance is not known. We randomised 38 obese patients to an out-patient programme of either an initial 4% weight loss target over a maximum of 4 weeks (Group 1) or 8% in 8 weeks (Group 2) with an LELD, followed by reintroduction of solid food over an 8 week period towards maintenance on a 30% restriction from estimated energy needs for a total treatment time of 6 months together with sibutramine 10-15 mg daily.

Mean baseline weight was 132 ±35 kg (86-203kg); BMI 45.6±8 kg/m<sup>2</sup> (35 - 67 kg/m<sup>2</sup>); waist circumference 124 ± 20cm (89.5cm - 164 cm). Total weight loss in completers in Group 1 (n=13, 14.5, 6.1, 8.4kg; completers, total, LELD, maintenance phases) did not differ from Group 2 (n=10, 16.2, 10.4, 5.8 kg). Changes in body composition (BodPod) did not differ between groups. Group 1 had a lower drop out rate with none during the LELD; 30% of group 2 patients failed to complete the LELD. Significant improvements in lipid profile and quality of life were seen. A shorter period of LELD may give similar results to longer duration treatment and result in better patient retention.

## T2:PS:69

**Longitudinal measurement of abdominal obesity in primary care.**Shephard, VE<sup>1</sup>, Finer, N<sup>2</sup><sup>1</sup>Anglia Ruskin University, Chelmsford, UK<sup>2</sup>Institute for Metabolic Science - Metabolic Research Laboratories, Cambridge, UK

Increasing epidemiological evidence links excessive central adipose tissue with cancer, cardiovascular and metabolic diseases. One of the challenges of providing health care for overweight and obese people is the limitations of the available methods to distinguish between weight change and adipose tissue distribution. Body mass index (BMI) is the gold standard for classification of overweight and obesity while waist circumference (WC) and sagittal abdominal diameter (SAD) have been proposed as methods of measuring central adiposity. The stability of these methods in a primary care setting was explored in a pragmatic longitudinal study, in which 28 people consented to repeated measurement at eight-week intervals for up to four years in a general practice surgery. Recording of BMI (weight/height<sup>2</sup>), WC using a simple tape measure, and SAD using the Holtain Kahn abdominal calipers enabled exploration of the reliability of these measures in the context of central adiposity. SPSS was used for the longitudinal and cross-sectional analysis of data by Pearson's correlation coefficient and linear regression.

In the cross-sectional data both SAD and WC performed well, although SAD correlated more strongly with BMI than did WC, with the exception of the overweight women. In the longitudinal data SAD showed a significant (p<0.01) stability for individual participants. In linear regression, only SAD performed consistently.

SAD is theoretically a better measure of intra- abdominal obesity than WC, and from a practical perspective within these findings SAD can be recommended for assessing central obesity in primary care.

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## T2:PS:68

**High prevalence of micronutrient deficiencies in severely obese patients**Ernst B.<sup>1</sup>, Thurnheer M.<sup>1</sup>, Schmid S. M.<sup>2</sup>, Schultes B.<sup>1,2</sup><sup>1</sup>Interdisciplinary Obesity Center, Kantonsspital St. Gallen, Rorschach, Switzerland<sup>2</sup>Internal Medicine I, University of Luebeck, Luebeck, Germany

Excessive food intake is the pathophysiological basis of obesity in most cases, but the quality of ingested foods might be poor. We report results on a comprehensive micronutrient assessment in 205 severely obese patients (BMI ≥35 kg/m<sup>2</sup>; mean ± SD: 44.6 ± 6.0 kg/m<sup>2</sup>), who were evaluated for bariatric surgery.

Deficiencies were found in 8.3% of the subjects for phosphate, 4.9% for magnesium, 6.3% for ferritin, 26.8% for zinc, 2.9% for folate, 18% for vitamin B<sub>12</sub>, and 89.3% for 25-OH vitamin D. In addition, 63.4% of the patients did not only show a mild (<75 nmol/l) but a moderate (<50 nmol/l) and 26.3% even a severe (<25 nmol/l) 25-OH vitamin D3 deficiency. According to the high prevalence of 25-OH vitamin D3 deficiency, 39% of the patients displayed a secondary hyperparathyroidism with PTH levels above 65 ng/l. In a subgroup of 76 patients selenium deficiency was found in 32.4% of the subjects, vitamin E deficiency in 2.4%, vitamin B<sub>3</sub> deficiency in 6.6%, and a vitamin B<sub>6</sub> deficiency in 2.6%, while none of patients had below cut-off levels for copper, vitamin A, and vitamin B<sub>1</sub>.

Data indicate a high prevalence (>10%) of zinc, selenium, vitamin B<sub>12</sub>, and 25-OH vitamin D3 deficiency in severely obese patients and a high rate of secondary hyperparathyroidism approaching almost 40%. Although the clinical significance of the found micronutrient deficiencies remains to be established, present results suggest that poor micronutrient state could contribute to the health impairing effects of obesity.

## T2:PS:70

**Psychopathology of Recurrent Binge Eating in Primary School Children**

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**Purpose:** To further understanding on the clinical significance of binge eating in children. Emerging evidence suggests that childhood binge eating is likely associated with overweight and obesity as well as with increased eating disorder and general psychopathology.

**Methods:** 60 children with binge eating, defined as ≥ 1 episode of loss of control over eating (LOC+) within the past 3 months, and 60 matched children without LOC history were recruited from the community. Clinical interviews and self-report questionnaires were used for psychopathological assessment.

**Results:** LOC+ children reported 5 LOC episodes during the past month, mostly objective bulimic episodes, assessed through the Child-Eating Disorder Examination. Recurrent LOC was reported by 31 children (51.7%). LOC episodes were associated with overweight and obesity (36, 60.0%), greater eating disorder psychopathology, depressiveness, but not with psychiatric diagnoses or general behavioral disturbances. A hierarchical cluster analysis based on the DSM-IV and other proposed research criteria of binge eating disorder in children showed a recurrent binge eating cluster including children with ≥ 1 LOC per month, high level of distress, and increased eating disorder psychopathology; an emotional eating cluster including highly depressed children who binge ate at lower frequency; and a non-disturbed cluster with no or occasional binge eating. Both binge eating clusters revealed increased body mass index.

**Conclusions:** These results show that the presentation of binge eating in children is heterogenous. Recurrent binge eating varies along dimensions of eating or mood disturbances. These findings suggest a differential indication for treatment of children from both binge eating clusters.

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## T2:PS:71

**Buccal skinfold thickness – a proxmarker for body fatness and fat distribution**

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**Background:** Obesity is characterized by an increase in fat mass. Usually in the setting of overweight and obesity fat is deposited in all body locations. Abdominal obesity – reflected in an increased waist circumference – is associated with an increased health risk. A positive relation exists between the body mass index (BMI), the total fat mass (TFM) as well as the waist circumference (WC). For cultural reasons patients often do not want to undress or refuse even anthropometric measurements. In this study the relationship between buccal skin fold thickness (BSF) with TFM, BMI and WC was studied in young adults.

**Methods:** 409 students (m/f = 179/230) at the age of 15 – 22 years (BMI 21.09 ± 1.81 kg/m<sup>2</sup>) were examined. Body weight, WC and BMI were measured according to the usual guidelines. The BSF was measured vertically in the middle of cheek between tragus and angulus oris using a calliper (Holtain LDT Crymych, UK). The average of three measurements was used. TFM was determined by bioimpedance (Tanita BF-410, Japan).

**Results:** There correlation coefficient (r) for the relationship between the different variables was for males/females:

	kg	BMI (kg/m <sup>2</sup> )	WC (cm)	TFM (%)
BSF (mm)	0.44/0.35	0.43/0.36	0.48/0.4	0.47 / 0.35

p for all < 0.01

**Discussion/Conclusions:** A significant relationship was found between BSF and body weight, BMI, WC and TFM. The relationship was strongest between BSF and WC in male (r = 0.48). Our data suggest that the measurement of the BSF might be a useful easy accessible proxy marker for the assessment of fat distribution in patients who do not want anthropometric measurements for cultural reasons.

## T2:PS:73

**Leptin and insulin levels in hypertensive, overweight or obese patients attending nutritional education program**Niegowska, J<sup>1</sup>, Gajewska, D<sup>2</sup>, Kucharska, A<sup>3</sup><sup>1</sup>National Institute of Cardiology, Warsaw, Poland<sup>2</sup>Department of Dietetics University of Life Sciences, Warsaw, Poland<sup>3</sup>Human Nutrition Department, Medical University, Warsaw, Poland

Comprehensive nutritional education can result in improving not only the quality of diet but also in reducing metabolic disorders. The aim of this study was to assess serum leptin and insulin levels in overweight or obese patients with essential hypertension attending nutritional education program provided by dietician.

A total of 125 pharmacologically-treated patients were recruited from the Outpatients Clinic of Hypertension at the National Institute of Cardiology in Warsaw. The study group consisted of 81 subjects (mean age 62.3±8.8 years and BMI 32.7±4.2 kg/m<sup>2</sup>) attending nutritional program. Forty four individuals from the control group (mean age 56.8±10 years and BMI 32.4±4.5 kg/m<sup>2</sup>) received standard medical counseling.

Baseline serum leptin and insulin levels, measured before nutritional education, were 22.8±15.5 µg/L, 15.9±7.9 µU/ml and 19.8±14.0 µg/L, 14.7±6.9µU/ml, in both groups respectively. After 6 month of education statistically significant decrease of leptin (Δ from baseline -4.04µg/L, p≤0.05) and insulin levels (Δ from baseline -1.84µU/ml, p≤0.05) was observed in the study group. Increase of both markers was found in the control group (Δ from baseline 0.09µg/L, NS, and 2.36µU/ml, p≤0.05, respectively). A decrease in body mass was found in 72% of individuals from the study group and in 41% subjects from the control group. Statistically significant decrease in both, systolic and diastolic blood pressure was found only in the study group (130±6 versus 127±6 mmHg, p≤0.05; and 84±3 versus 83±4 mmHg, p≤0.05, respectively).

It was concluded that nutritional education could be effective strategy for hypertension and obesity management.

## T2:PS:72

**Multidisciplinary project for obese children – family history, physical exercise and self-image of children upon recruitment**Herberholz N<sup>1</sup>, Brown K<sup>1</sup>, Dickson E<sup>1</sup>, Hall T<sup>2</sup>, Walker L<sup>1</sup>, Hay S<sup>2</sup>, Dale A<sup>1</sup><sup>1</sup>Gateshead Health Foundation Trust, Tyne and Wear, UK<sup>2</sup>South of Tyne Primary Care Trust, Tyne and Wear, UK

**Background:** We offer a multidisciplinary intervention for obese children aged 5-16, 258 children have been recruited since April 2005.

**Aims:** To assess family history, physical exercise and self-image on recruitment.

**Method:** On entering the project questionnaires were filled in. Questionnaires were evaluated for 52 randomly selected children, which are representative of all participants with respect to age, gender and BMI.

**Results:** 67% of children have other family members who worry about their weight, 61% of these are 1<sup>st</sup> degree relatives. Weight related illnesses (cardiovascular or diabetes type II) occur in 12% of 1<sup>st</sup> degree and 40% of 2<sup>nd</sup> degree relatives. Almost all children (98%) report to exercise, but 35% solely attend school PE lessons. Only a minority (13%) exercise at least 60 minutes/day. 89% of children own a bike, only 29% ride it regularly. 54% walk to school, but often infrequently. Much time is spent watching TV or playing computer games with 30% of the children spending more than 2 hours per day. 71% of children have expressed concerns about their weight and 50% experienced bullying.

**Conclusions:** Obesity and its complications are common in the children's families. Most children report being active, but actual levels of exercise are mostly inadequate. The emotional cost on children was highlighted with high rates of bullying and concern about body weight. Recognition of these characteristics have contributed to the development of our local project with family participation, dietician and school nursing involvement and promotion of physical exercise through local authority facilities.

**Funding:** We are grateful to Gateshead Council and the Department of Health for funding this project through a local public service agreement.

There are no conflicts of interest to disclose.

## T2:PS:74

**Changes in body weight and percentage body fat during and after Ramadan in women**Hollander AM<sup>1</sup>, Hesselting MG<sup>1</sup>, van Bavel-Verreijen AM<sup>1</sup>, Weijs PJM<sup>1</sup><sup>1</sup>Amsterdam School of Nutrition and Dietetics, Hogeschool van Amsterdam, Amsterdam, The Netherlands

**Background:** Ramadan fasting is a religious daytime fasting, which might result in loss of body weight and percentage body fat. We sought to find changes in body weight and percentage body fat in women adhering to Ramadan fasting.

**Methods:** Women from a nearby community center were asked to participate into the study. Body weight and composition were measured by densitometry (BOD POD). Measurement were taken a few days before the start of Ramadan, about 25 days later (3.5 weeks into Ramadan) and about 25 days later (3 weeks after Ramadan). One sample t-test was used.

**Results:** Included were 21 women, loss to follow-up 9. For 12 women mean age was 33 (sd 11) y, BMI 24.6 (5.1), body weight 63.9 (14.2) kg, percentage body fat 31.4 (10.9) %. By the end of Ramadan body weight had decreased by 0.17 kg (95% CI -0.64-0.29) and body fat percentage by 0.68% (95% CI -2.03-0.66). However, between end of Ramadan and 3 weeks after Ramadan body weight increased by 0.88 kg (p=0.005; 95% CI 0.32-1.44) and percentage body fat increased by 2.09% (p=0.061; 95% CI -0.1-4.3). Total increase in body weight over 7 weeks was 0.65 kg (p=0.063; 95% CI -0.04-1.35).

**Conclusion:** The benefit of Ramadan fasting for body weight and percentage body fat seems to be of short duration. For overweight women, short term weight loss might be a risk factor for weight cycling.

## T2:PS:75

**Dairy Calcium Supplementation in Overweight and Obese Individuals; its effect on markers of fat metabolism**

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Dairy calcium supplementation has been proposed to increase fat oxidation and inhibit lipogenesis. This study investigated the effects of calcium supplementation on markers of fat metabolism.

Ten overweight/obese individuals with habitually low calcium intakes received 800 mg/d dairy calcium for 5 weeks. After 4 weeks, an adipose tissue biopsy was taken for analysis of gene expression. Respiratory exchange, glycerol turnover and subcutaneous adipose tissue microdialysis was performed for 7 hours after consuming 400 mg calcium or placebo, with randomized slow release caffeine (SRC; 300 mg) or lactose intake (500 mg). One week later the test was repeated with the SRC/lactose cross-over.

Calcium supplementation increased urinary calcium excretion 28% ( $p < 0.05$ ), but did not alter plasma PTH and osteocalcin concentrations. Resting energy expenditure (REE;  $59.9 \pm 3.0$  kcal/h vs  $59.6 \pm 3.3$  kcal/h), fat oxidation (FO;  $58.4 \pm 2.5$  mg/min vs  $53.8 \pm 2.2$  mg/min), plasma free fatty acid concentrations (FFA;  $0.63 \pm 0.02$  mmol/L vs  $0.62 \pm 0.03$  mmol/L) and glycerol turnover ( $3.63 \pm 0.41$   $\mu$ mol/kg/min vs  $3.67 \pm 0.38$   $\mu$ mol/kg/min) were similar with or without calcium supplementation. SRC increased FFA concentrations, resting FO and REE. During microdialysis, epinephrine infusion increased dialysate glycerol concentrations 255% without and 254% with calcium supplementation. Expressions of 7 key metabolic genes in subcutaneous adipose tissue were not affected by calcium supplementation.

Calcium supplementation, in overweight subjects with a low habitual calcium intake, failed to alter whole body lipolysis, lipid oxidation, and energy expenditure under resting conditions and during stimulation by caffeine or epinephrine.

## T2:PS:77

**What is the Energy Deficit Required Per Unit Weight Loss?**

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One of the most pervasive weight loss rules is that a cumulative energy deficit of 3500 kcal is required per pound of body weight loss, or equivalently 32.2 MJ per kg. Under what conditions is it appropriate to use this rule of thumb and what are the factors that determine the cumulative energy deficit required per unit weight loss? Here, I examine this question using a modification of the classic Forbes equation that predicts the composition of weight loss as a function of the initial body fat and magnitude of weight loss. The resulting model predicts that a larger cumulative energy deficit is required per unit weight loss for people with greater initial body fat – a prediction supported by published weight loss data from obese and lean subjects. This may also explain why men can lose more weight than women for a given energy deficit since women typically have more body fat than men of similar body weight. Furthermore, additional weight loss is predicted to be associated with a lower average cumulative energy deficit since a greater proportion of the weight loss is predicted to result from loss of lean body mass which has a relatively low energy density in comparison with body fat. The rule of thumb approximately matches the predicted energy density of lost weight in obese subjects with an initial body fat above 30 kg but overestimates the cumulative energy deficit required per unit weight loss for people with lower initial body fat.

This work was supported by the Intramural Research Program of the NIH, NIDDK.

## T2:PS:76

**Personality and eating behaviour in obesity: poor self-control in emotional and external eating but personality assets in restrained eating**

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**Background:** Eating behaviours are essential in obesity but still insufficiently understood psychologically. The objective was to analyze eating behaviour in terms of personality traits.

**Method:** 442 obesity patients (BMI  $41 \pm 5$  kg/m<sup>2</sup>, age  $44 \pm 13$  years) participated. Eating behaviours was measured with the Dutch Eating Behaviour Questionnaire (DEBQ) and personality traits according to the Big Five theory with the NEO Personality Inventory – Revised (NEO PI-R).

**Results:** *Emotional eating* was strongly positively associated to Neuroticism ( $r = .48$ ,  $p < .001$ ), in particular impulsiveness and depression ( $r = .45-.49$ ,  $p < .001$ ), and further linked to lower Conscientiousness ( $r = -.26$ ,  $p < .001$ ) mainly seen in lower self-discipline ( $r = -.33$ ,  $p < .001$ ), and to lower Extraversion ( $r = -.14$ ,  $p < .01$ ). *External eating* was likewise mainly associated to the Neuroticism facets impulsiveness ( $r = .51$ ,  $p < .001$ ) and lower self-discipline ( $r = -.24$ ,  $p < .001$ ). *Restrained eating* was related to higher Conscientiousness ( $r = .22$ ,  $p < .001$ ), Extraversion ( $r = .15$ ,  $p < .01$ ) and Openness ( $r = .13$ ,  $p < .01$ ), and to lower Neuroticism ( $r = -.18$ ,  $p < .001$ ). In linear regression models personality could explain 10 to 42 percent of the variance in the eating behaviours.

**Conclusion:** These results imply that poor self-control seen in impulsiveness and lower self-discipline was most important for eating due to negative emotions as well as in response to external food stimuli, suggesting that the inhibition of eating and difficulties to govern ones behaviour are major aspects of these eating behaviours. Attempts to control food intake and body weight seen in restrained eating were associated with more character strengths and ambitions, and also a more outgoing personality style with more stable emotions.

## T2:PS:78

**The Efficacy of a Cognitive-Behavioural Short-Term Treatment for Binge Eating Disorder (BED)**

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Cognitive-behavioral treatment (CBT) approaches of different length and delivery format (e.g. group and individual setting, therapist-guided self-help) have demonstrated efficacy in the treatment of binge eating disorder (BED). This study evaluated the efficacy of a short-term CBT including 8 weekly sessions, followed by five booster sessions during the 12-month follow-up period. Thirty-six female participants with BED were randomly assigned to eight weeks of CBT or a waitlist condition. Core symptoms of BED (abstinence rates from binge eating, number of objective binge episodes, self-reported weekly binges, body mass index) and associated eating disorder psychopathology (shape and weight concern, eating concern, dietary restraint) were assessed repeatedly up to 12 months following treatment using structured diagnostic interviews and self-report measures. Participants' compliance and therapist's adherence to the treatment protocol were assessed. Statistical analyses were conducted using Linear Mixed Models for continuous variables, and Generalized Linear Models (GLMMs) for dichotomous variables. Short-term CBT produced significant reductions in the number of objective binge eating episodes and significant improvements in the percentage of patients abstaining from binge eating at 12-month follow-up. Findings suggest that the short-term CBT is efficacious in reducing core symptoms of BED, thus providing a cost-effective treatment option for patients with BED.

## T2:PS:79

## Effects of soyprotein alone or as part of a meal on the somatotrophic axis

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Growth hormone (GH) is an important regulator of growth and body composition. It has been shown that GH-release can be promoted by intravenous or oral administration of various single amino acids (AA), either alone or in combination. The effects of dietary protein on GH-secretion, however, are less well described.

The effects of dietary protein on GH-secretion are investigated in two different studies: firstly, we compared oral ingestion of hydrolysed soy protein and complete soy protein with an AA-mixture (reflecting the AA composition of soy protein) and, secondly, we compared ingestion of a complete meal containing soy protein as the sole protein source with soy protein alone. Both studies were performed in eight healthy women (age:19-36y, BMI:19-26 kg/m<sup>2</sup>) in a randomized single blind, placebo-controlled crossover design. Serum GH was determined every 20 min during 5 h.

Ingestion of the complete soy protein, hydrolysed soy protein and the AA-mixture all increased plasma GH-responses (either by area under the curve or peak values) to a similar extent, when compared with placebo ( $p < 0.05$ ). The GH-responses to ingestion of soy protein ( $p < 0.05$  versus placebo) were completely abolished when soy protein was ingested as part of a complete meal.

In conclusion, ingestion of soy protein, either hydrolysed or intact, as well as amino acids reflecting soy protein stimulates GH-release to a similar extent. This effect, however, is not present when soy protein is ingested as part of a complete meal, suggesting that other macronutrients counteract the somatotrophic actions of soy protein.

## T2:PS:81

## The efficacy of intragastric balloon on reducing weight, alleviating psychological discomfort and improving quality of life in obese patients: a prospective study

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**Background and aims:** Obesity has become a modern epidemic associated with poor quality of life (QOL) and increased levels of psychological discomfort. The intragastric balloon is a non-surgical, reversible obesity treatment with promising yet inconclusive results. The aim of the current study was to assess its effect on controlling body weight and improving patients' psychological function and QOL.

**Patients and methods:** Thirty seven (37) adult obese patients with no contraindications to balloon placement were enrolled to this prospective study. Participants were interviewed before the intragastric balloon placement (time 1) and at 6 months (time 2), when the balloon was removed. Psychological function and QOL were assessed by the Hospital Anxiety Depression Scale (HADS) and the Short Form Health Survey (SF-36), respectively.

**Results:** Two patients (5.4%) had the balloon removed before study completion, because of nausea and vomiting. Patients' mean initial body weight was 117.9 (22.1) kg with a mean BMI of 41.7 (5.0). At time 2, patients' mean body weight was significantly decreased ( $p = 0.000$ ) with a mean loss of 17.5 (11.3) kg. In addition, patients reported a significant reduction in anxiety ( $p = 0.035$ ) and depression ( $p = 0.046$ ) scores and a major improvement in all subscales of the SF-36 including physical functioning ( $p = 0.000$ ), role functioning due to physical ( $p = 0.001$ ) or emotional ( $p = 0.002$ ) problems, bodily pain ( $p = 0.021$ ), vitality ( $p = 0.012$ ), social functioning ( $p = 0.003$ ), general ( $p = 0.005$ ) and mental ( $p = 0.013$ ) health.

**Conclusions:** The intragastric balloon is a well-tolerated obesity treatment, associated with significant weight reduction and major improvement in patients' psychological function and QOL.

## T2:PS:80

## Does the Risk Profile of Patients with Cardiovascular Disease and/or Diabetes Modify Initial Response to Treatment with Sibutramine? A Preliminary Analysis of the Sibutramine Cardiovascular Outcomes (SCOUT) Trial

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**Introduction:** SCOUT is an ongoing, placebo-controlled trial to assess cardiovascular (CV) outcomes in overweight/obese patients at high CV risk. It is a post-approval commitment to the European Regulatory Authorities prompted by concern that sibutramine's (SIB) mode of action could exacerbate hypertension (HT). SIB would be contraindicated in most patients eligible for SCOUT; however, approximately 10% of those enrolled were at lower risk and met criteria in current EU Summary of Product Characteristics (SPC-"label"). Data from the 6-week lead-in period when all patients received SIB 10 mg plus weight management allow an assessment of initial response in these 2 groups.

**Patients and Methods:** Patients eligible for SCOUT were aged  $\geq 55$  years with BMI  $\geq 27$  to  $\leq 45$  kg/m<sup>2</sup>, or  $\geq 25$  to  $< 27$  kg/m<sup>2</sup>, waist circumference  $\geq 102$  cm (men)/ $\geq 88$  cm (women), blood pressure  $\leq 160/\leq 100$  and had a history of CV disease (coronary artery disease, myocardial infarction, stroke) or had type 2 diabetes mellitus (DM) and another risk factor. The subset of SCOUT patients who met "label" criteria were  $\leq 65$  years, with BMI  $> 27$  kg/m<sup>2</sup>, BP  $\leq 145/90$  mmHg, with DM and another risk factor, but without a contraindicated CV history.

**Results**

Median Changes at End of 6 Weeks (LOCF analysis)

	Eligible by SPC (n=1105)	Contraindicated by SPC (n=9637)
Initial body weight (kg)	96.0	94.6
Change (kg)	-2.2	-2.2
(%)	-2.4	-2.3
Initial systolic/diastolic BP (mmHg)	133.5/76.0	140.0/79.5
Change (mmHg)	-1.0/0.5	-3.5/-1.0
Initial heart rate (bpm)	74.0	70.0
Change (bpm)	3.0	1.5

**Conclusion:** SCOUT patients who are normally contraindicated for SIB treatment (current SPC criteria) showed greater median falls in BP and smaller increases in heart rate compared to the "current labelled" population; this was despite similar weight loss. The per-"label" group showed similar changes in BP and heart rate to those seen previously in randomized controlled trials.

**Conflict of Interest:** Payment received from Abbott Laboratories for participation in the Executive Steering Committee of the SCOUT study.

**Funding:** Research relating to this abstract was funded by Abbott Laboratories.

## T2:PS:82

## Heart rate variability and baroreflex sensitivity responses to weight loss following bariatric surgery

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**Background:** Obesity is associated with autonomic nervous system dysfunction, mainly due to hypertension, hyperinsulinemia and hyperleptinemia.

**Aim:** To assess changes in autonomic function as expressed by indices of baroreflex sensitivity and heart rate variability in obese patients following weight loss by bariatric surgery.

**Patients and Methods:** Twelve morbidly obese patients (BMI= 49.85±7 Kg/m<sup>2</sup>, age= 38.58 ±8.00) underwent either Roux-en-Y gastric bypass (n=8) or sleeve gastrectomy (n=4). Baroreflex sensitivity (BRS) was assessed at rest for 20 minutes with the Barocor® device, which records spontaneous changes in blood pressure and heart rate, while heart rate variability (HRV) was measured at rest for 5 minutes [Power of High Frequency (PHF), Power of Low Frequency (PLF) and Total Power (TP)]. All measurements were made preoperatively and 1 and 3 months after surgery.

**Results:** All patients experienced significant weight loss (BMI at 1 month= 44.21 ±6.42, at 3 months= 42.34 ±5.46 Kg/m<sup>2</sup>). Improvement was not statistically significant for BRS or for HRV 1 month postoperatively. However, at three months, all indices of HRV had significantly improved (median values [interquartile range]: PHF3months= 818.1 [184.5-2635.5] vs PHFpreop= 170.7 [99.1-595.2] ms<sup>2</sup> [P=0.016], PLF3months= 773.8 [548.3-852.3] vs PLFpreop= 164.7 [91.7-492.1] ms<sup>2</sup> [P=0.002], TP3months= 1527.3 [822.4-3386.8] vs TPpreop= 603.2 [305.7-718.0] ms<sup>2</sup> [P<0.001]). BRS also displayed significant improvement at three months (BRS3months= 11.7 ±7.3 vs BRSpreop= 6.1 ±1.8 ms/mmHg, P=0.033).

**Conclusion:** Weight loss after bariatric surgery leads to significant improvement in autonomic nervous system function, as assessed by both baroreflex sensitivity as well as heart rate variability.

## T2:PS:83

**Weight management interventions in general practice: a pilot study**Nanchahal, K<sup>1</sup>, Townsend, J<sup>1</sup>, Letley, L<sup>2</sup>, Haslam, D<sup>3</sup>, Wellings, K<sup>1</sup>, Haines, A<sup>1</sup><sup>1</sup>London School of Hygiene & Tropical Medicine, London, UK<sup>2</sup>General Practice Research Framework, London, UK<sup>3</sup>Watton Place Clinic, Hertfordshire, UK**Objectives:** To ascertain the feasibility of a trial of weight management in general practice using a computer-based lifestyle support package and pedometers.**Design:** Parallel group randomised controlled trial (RCT).**Setting:** General practices in the UK.**Participants:** 127 adults with BMI  $\geq 27$  kg/m<sup>2</sup>**Methods:** Participants were recruited from eight practices and randomly allocated to one of four groups: control (33), pedometer only (31), structured lifestyle support only (32), structured lifestyle support plus pedometer (31). Nurses used the ProHealthClinical computer package to structure discussions with participants in the structured support groups, meeting with them for 20 to 40 minutes fortnightly for two months, then at three months. Those in the pedometer groups were given a pedometer and brief instructions on its use. Participants not receiving structured support received standard care.**Results:** Mean weight loss ranged from 5% (combined intervention) to 1% (control) after three months. There was some evidence of an interaction between the level of support and provision of a pedometer in weight-related outcomes and of changes in other factors associated with being overweight. Some participants reported that pedometers motivated them to be physically active. Nurses reported that the computer package was easy to use and helped them deliver personalised care.**Conclusions:** A trial of the interventions is feasible and practicable in general practice. A computer-based lifestyle support package and pedometers could make a substantial contribution to improving the provision of weight management services in general practice and need to be fully evaluated in a RCT.**Funding:** Research related to this abstract was funded by the British Heart Foundation and Department of Health

## T2:PS:85

**An online weight loss system for children and adolescents - obstacles and solutions**Pretlow, R<sup>1</sup><sup>1</sup>eHealth International, Seattle, Washington, USA

Healthcare resources are grossly inadequate to treat the estimated 25 million obese/overweight children and adolescents in the United States. Technology offers potential solutions. An Internet-based weight loss system was created, by which overweight children and adolescents may: 1) be educated on healthy eating and exercise; 2) receive support from overweight peers; and 3) self-monitor weight with online support and guidance from their healthcare provider. Results of a two-year outcomes study on 124 overweight school and clinic children, with 36 providers, are encouraging.

**Obstacles encountered include:** 1) minimal computer knowledge by providers; 2) lack of provider time to monitor data and post supportive messages; 3) lack of reimbursement for Internet-delivered care; 4) lack of home Internet access by children; 5) lack of time for children to access the system at school; 6) licensure issues when delivering care across state borders; 7) provider privacy concerns that personal information may be stolen from the database; 8) provider liability concerns that a hacker/predator may obtain a provider's password and spoof/prey upon a child.

Solutions developed include: 1) automatic email notification to providers of excessive weight gain and when a child has weighed-in or not weighed-in within the provider specified time frame; 2) automatic weigh-in reminders to children, if not weighed-in within their provider-specified period; 3) pre-written weight control messages (templates) sent automatically to children at the provider-specified interval, including provider's photo and signature; 4) Internet-connected scales, constituting "electronic accountability".

Internet technology has the potential to impact on childhood obesity, if remaining obstacles can be overcome.

**Conflict of Interest:** The web system described in this abstract is owned by eHealth International.

## T2:PS:84

**Wernicke's encephalopathy after bariatric surgery: A systematic review of 76 cases**Aasheim, ET<sup>1</sup><sup>1</sup>Department of Medicine, Aker University Hospital and Faculty Division Aker University Hospital, University of Oslo, Oslo, Norway**Objective:** Weight loss surgery may lead to nutritional complications. Wernicke's Encephalopathy (WE) is a medical emergency caused by severe deficiency in thiamine (vitamin B-1); the classical clinical features are mental confusion, eye movement disturbances, and gait instability. This review summarises the presentation and outcomes of WE reported after bariatric surgery.**Methods:** Literature searches were done in PubMed, and bibliographies of relevant articles were hand searched. WE was diagnosed using Caine's operational criteria. Only one instance was counted when the same case was reported several places. Patient outcomes at latest reported follow-up were defined as complete recovery or incomplete recovery (any residual deficit observed clinically).**Results:** A total of 76 cases of WE after bariatric surgery published during 1977 to 2007 met the operational criteria. These patients were admitted median 90 days after weight loss surgery, and 70 (92%) were admitted within 6 months. Frequent vomiting was a precipitating factor in 67 patients (88%). Patient outcomes ranged from full recovery to death, with incomplete recovery in 42 patients (55%). The 43 cases reported year 2000 or later had significantly better outcomes compared with 33 cases reported earlier, odds ratio for complete recovery 3.7 (95% confidence interval, 1.4 to 9.8). WE occurred after all types of weight loss procedures.**Conclusions:** The number of Wernicke's encephalopathy cases following bariatric surgery is substantially higher than previously suggested. Nearly all cases presented within 6 months of surgery in association with frequent vomiting. Improved patient outcomes recent years might indicate an increased awareness of this complication.**Funding:** Research relating to this abstract was funded by a research fellowship grant from Eastern Norway Regional Health Authority.

## T2:PS:86

**Weight loss and loss of fat mass by the Sonja Bakker method: short-term results**Hesseling MG<sup>1</sup>, Dekker M<sup>1</sup>, van Bavel-Verreijen AM<sup>1</sup>, Weijs PJM<sup>1</sup><sup>1</sup>Amsterdam School of Nutrition and Dietetics, Hogeschool van Amsterdam, Amsterdam, The Netherlands**Background:** The Sonja Bakker method (SB) is a hype in the Netherlands. It is a low calorie diet (around 950 kcal/d), based on a book with daily menus for 9 weeks. We compared SB with individual advice from a registered dietician (RD).**Methods:** Subjects were free to choose between SB and RD. RD advised to decrease intake and increase physical activity with a total negative energy balance of 500 kcal/d. Fat mass was assessed by a 3 compartment model at 0 and 9 weeks, using air displacement plethysmography (BOD POD) for body density and bio-impedance spectroscopy (Bodyscout) for body water. Intake and physical activity were assessed for RD, not for SB since this was considered intervention by RD.**Results:** Included were 35 subjects (SB 17, RD 18), with no differences in age, weight and body composition. For both SB and RD loss to follow-up was 30%. RD realised a mean energy deficit of 467 kcal/d (intake 360; physical activity 107). SB and RD had similar weight loss (SB  $-2.5 \pm 3.2$  vs RD  $-2.2 \pm 1.6$  kg) and loss of fat mass (SB  $-2.0 \pm 2.6$  vs RD  $-2.2 \pm 1.5$ ). 17% of SB subjects were convinced about continuation of menus, 82% of RD subjects were convinced about continuation of changes in intake and physical activity.**Conclusion:** On the short term, small changes in diet and physical activity as advised by the dietician and the Sonja Bakker method seem to be equally effective for weight loss. Long-term evaluation is needed.

## T2:PS:87

**The general quality of life SF-36 scores correlate negatively with body mass index and the mental health scale with iron in serum.**Sierra A<sup>1</sup>, Formiguera X<sup>1</sup>, López-Alvarenga JC<sup>2,3</sup>, Comuzzie AG<sup>2</sup>, Higgins P<sup>2</sup><sup>1</sup>Obesity Unit. University Hospital Germans Trias I Pujol. Badalona. Spain<sup>2</sup>Department of Genetics. Southwest Foundation for Biomedical Research. San Antonio. Texas<sup>3</sup>Hospital Regional de Veracruz SS. Mexico

The quality of life (QoL) has been measured with generic questionnaires such as the SF-36. The present pilot study assessed whether these QoL scores correlated with BMI, socioeconomic status, and biochemical markers of nutritional status.

We included 71 subjects (52 women), aged 40.4±11.8 years with BMI 32.4±9.6 (min 18.5, max 56.8). The subjects completed the SF-36 questionnaire and were interviewed for evaluation of socioeconomic status. Blood samples were taken for measurements of 17 biochemical markers related to nutrition. Body composition was determined using bioelectrical impedance analysis. A factor analysis was used to calculate four subjacent factors for the biochemical markers and its scores were used in the analysis. Pearson correlation analysis and the MANOVA test were performed. SF-36 scales correlated with BMI: Physical function (r=-0.43), physical activity (r=-0.30), pain (r=-0.29), general health (r=-0.23), vitality (r=-0.46), social function (r=-0.25), emotions (r=-0.32) and mental health (r=-0.46), p<0.05, for all. Other measurements such as body fat percentage and waist circumference showed the same trend of correlations with the SF-36 measures. Only the mental health portion of the QoL was correlated with the nutrition factor 2 (r=0.3), suggesting a relation between mental health deterioration and low serum concentration of iron, hemoglobin, homocysteine, and transferrin.

Vitality was inversely associated with socioeconomic status, after adjustment for sex and age.

We conclude that QoL is greatly affected by BMI, the nutrition factor that implies variables related to iron status was inversely correlated with mental health. Data exist that support this association. Other studies have shown that vitality is associated with fatigue, our findings suggest this vitality score is independent explained by BMI and socioeconomic status.

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## T2:PS:89

**Experience of obesity management**Ionova, L<sup>1</sup>, Belova, E<sup>2</sup>, Studenikina, M<sup>2</sup><sup>1</sup>Medical Center "Dr. Ionova's clinic", Moscow, Russia

"Dr. Ionova's clinic" has the 5 years experience of obesity management. There are same directions of obesity management in the clinic: individual nutritional counseling, individual psychological counseling, group nutritional and psychological counseling, massage and cosmetic procedures.

On the 1<sup>st</sup> session dietitian clarifies the request of client, evaluates its reality and suggests the program which meets his needs. On the 1<sup>st</sup> session dietitian obtains the history, appoints the examination, and forms the primary diagnosis. Psychologist defines the primary psychological profile of client.

The nutritional program consists of weekly sessions for meeting the result. Dietitian forms the diagnosis and designs the individual nutrition program which meets all requirements of client. The weight reduction is controlled by weekly bioimpedance analysis, so one of the dietitian targets is to keep body cell mass of client and to reduce mostly body fat. Depending on the obtained weekly results the diet can be changed.

All dietitians of clinic have skills of nutritional behavior changing and they weekly analyze it and help to improve client's nutritional behavior. So For psychological consulting, a combination of CBT, Art Therapy and Gestalt Therapy methods was employed.

After achieving his object client is offered the program of keeping the result for 6 months. The program includes monthly nutritional and behavioral sessions when the client is taught to extend the diet and keep the result.

## T2:PS:88

**Nutritional construct using biochemical variables and its association with body composition**Formiguera X<sup>1</sup>, Sierra A<sup>1</sup>, López-Alvarenga JC<sup>2,3</sup>, Comuzzie AG<sup>2</sup>, Higgins P<sup>2</sup><sup>1</sup>Obesity Unit. University Hospital Germans Trias I Pujol. Badalona. Spain<sup>2</sup>Department of Genetics. Southwest Foundation for Biomedical Research. San Antonio. Texas<sup>3</sup>Hospital Regional de Veracruz SS. Mexico

**Objective:** To determine subjacent factors that can explain biochemical markers associated with body composition.

**Methods:** We included 71 subjects (52 women) with age 40.4±11.8 years and BMI 32.4±9.6 (min 18.5, max 56.8). Blood samples were taken for quantification of 17 biochemical markers related to nutritional status. Basic anthropometric measures were taken and body composition was measured using bioelectrical impedance. A factor analysis was used to assess at least four subjacent factors of nutritional status and their association with the anthropometric and body composition variables.

**Results:** We found two nutritional factors that were directly related to BMI. However, factor 1 was associated with lean mass, while factor 2 was associated with body fat. Factor 1 correlated with BMI (r=0.46) and lean mass (r=0.62); indicating that triglycerides, insulin, retinol-binding protein, ferritin and homocysteine had a direct correlation but HDL-C, serum folate and cobalamin was inverse. Factor 2 showed inverse correlation with BMI (r=-0.45) and body fat percentage (r=-0.54). As body fat increased there was a decrease in serum iron level, hemoglobin, and an increase in homocysteine and transferrin. Prealbumin was inversely related to body fat (r=-0.38) and BMI (r=-0.32), while pepsinogen was directly associated with BMI (r=0.33) and gastrin (r=0.33). Serum creatinine was related to waist circumference (r=0.42), and lean body mass (r=0.70). Interestingly, creatinine/height index and gastrin did not show an important effect in this group of patients.

**Conclusion:** Biochemical nutritional status markers had differential associations with body composition. The least useful index was the creatinine/height index that did not show any correlation with the studied variables. We found that nutritional markers are not useful for the assessment of malnourishment in obese subjects. These nutritional markers have been used for undernourished subjects. Recently some researchers have suggested that obese patients have a degree of malnourishment; this study does not support this concept. The findings in obese individuals may reflect an epiphenomenon related to circulating marker dilution due to the higher blood volume found in obese individuals.

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## T2:PS:90

**The using of specialized protein shake "formlik" in nutritional practice**Kopytro, M<sup>1</sup>, Ionova, L<sup>1</sup><sup>1</sup>Medical Center "Dr. Ionova's clinic", Moscow, Russia

This high-quality specialized product "FormLik" was developed in "Dr. Ionova's clinic" in 2001 and has been used since that. Reliable data of the effectiveness of using the product for nutritional patients have been received by now.

The effect is reached by means of active components of the shake. The shake includes soy protein (with all essential amino acids), a complex of vitamins, minerals and lactulose. As a fiber, lactulose gives the filling of fullness, stabilizes the function of intestinal tract, provides probiotic effect of intestinal tract improvement, which lasts for a long time after finishing the nutrition program.

Indications: obesity, low nutrition, as additional nutrition at exercises.

Contraindication: individual intolerance, renal-hepatic insufficiency.

The comparative analysis of two groups of patients (1<sup>st</sup> – taking the shake during weight reduction, 2<sup>nd</sup> – omitting the shake during weight reduction) showed:

1. 1<sup>st</sup> group patients (1GP) lost the weight faster, than 2nd group patients (2GP).
2. 1GP doesn't have hunger attacks, they feel fullness faster, than 2GP and for a longer period.
3. 1GP has fewer nutrition breaks.
4. 1GP normalizes the blood cholesterol and other lipids levels faster, than 2GP.
5. 1GP improves the intestinal function.

The patients get easy cooking. Preparation: the necessary amount of shake is stirred with dairy products or sour-milk products. It is used for breakfast and/or for dinner. The portion and the period of shake intaking are determined by the supervising doctor.

## T2:PS:91

**Glucose control versus BMI of patients with type 2 diabetes. A comparison between the years 1998 and 2006.**

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**Background:** During the last decade, stricter glycemic control has been proposed for patients with type 2 diabetes (T2D). However, intensive treatment of glycemia has been associated with an increase in body mass index (BMI).

**Aim:** Aim of the present study was to compare BMI in relation to the glycemic control of T2D patients, between the years 1998 and 2006, in a single diabetes center.

**Patients-Methods:** We compared the medical records of 263 patients who visited the Diabetes Outpatient Clinic of our University Hospital during 1998 with those of 336 different patients who visited the Clinic during 2006. Only records from patients who were followed-up for at least 3 months were included.

**Results:** The two groups were comparable in terms of age, gender, duration of diabetes and duration of follow-up. The 2006 group had a higher BMI compared to the 1998 group ( $29.96 \pm 4.88 \text{ kg/m}^2$  vs.  $28.88 \pm 4.83 \text{ kg/m}^2$ ,  $P=0.01$ ). The difference was highly significant in patients receiving oral antidiabetic agents (OAA) ( $30.01 \pm 4.72 \text{ kg/m}^2$  vs.  $28.34 \pm 4.41 \text{ kg/m}^2$ ,  $P<0.001$ ), while in insulin-treated patients there was only a trend towards an increase in 2006 ( $30.59 \pm 5.40 \text{ kg/m}^2$  vs.  $29.71 \pm 5.26 \text{ kg/m}^2$ ,  $P=0.16$ ). The mean value of HbA<sub>1c</sub> decreased from  $7.41 \pm 1.36\%$  in 1998 to  $6.95 \pm 1.04\%$  in 2006 ( $P<0.001$ ). There was an intensification of therapy in 2006 as expressed by the mean number of antidiabetic medications taken per patient (1.59 in 1998 vs. 1.84 in 2006,  $P=0.001$ ).

**Conclusion:** Glucose control of T2D patients improved in 2006 compared to 1998, but this improvement was accompanied by an increase in their BMI, especially in those receiving OAA therapy.

## T2:PS:93

**Greater fat and weight loss with protein-enriched meal replacement shakes compared to conventional diet over one year in metabolic syndrome patients**

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In order to test the effects of protein-enriched meal replacement (MR) shake in metabolic syndrome (MS), 110 subjects (age  $49.8 \pm 2.6$  yr, BMI  $36.2 \pm 4.7 \text{ kg/m}^2$ ) were randomly assigned to a protein-rich diet (P group) providing 2.2 g protein / kg lean body mass using two meal replacement (MR) shakes (Herbalife Formula 1) combined with a protein supplement (Herbalife Performance Protein Powder) per day with a diet plan compared to a conventional diet (C group) using foods alone to provide 0.8 g protein / kg body weight for 3 months with prescribed calorie restriction of 500 kcal/day. For 9 months of weight maintenance, both groups consumed 1 MR shake daily. Dietary macronutrients with 30% energy from fat was maintained for both groups. 74 of 110 subjects (31 P and 43 C) completed the study. At 12 months, weight loss in the P group was  $11.2 \pm 6.4$  kg or 11.8 % of initial body weight compared to  $6.52 \pm 5.8$  kg or 6.92 % of initial body weight in the C group. The loss of fat mass was greater in the P group than in the C group with a ratio of fat loss to lean of 3.44 in P and 1.96 in C. 64.5 % in P and 41.7 % in C group no longer met metabolic syndrome criteria with no abnormalities of liver or renal function in any subject. Protein-enriched MR shakes resulted in greater than 10% average weight loss in MS.

(Supported by a grant from Herbalife International)

## T2:PS:92

**Are there differences in the metabolic risk profile of middle-aged pre- and early postmenopausal obese women before and after a 16-week walking program?**

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In women, menopause transition is associated with numerous metabolic disturbances named as metabolic syndrome. To the best of our knowledge, no study has yet examined the metabolic risk profile of middle-aged pre- and early postmenopausal obese women.

**Methods:** 14 pre- ( $49 \pm 2$  years) and 11 postmenopausal women ( $52 \pm 3$  years) whose body mass index was  $32 \pm 3$  and  $30 \pm 2 \text{ kg/m}^2$ , respectively ( $p=0.12$ ) were compared for their metabolic and inflammatory profiles after 3 sessions/week of 45 min-walking each, at 60% of heart rate reserve, during 16 weeks. Body composition was assessed by bioelectric impedance and  $\dot{V}O_{2\text{max}}$  estimated by the 2 km-walking test. Fasting plasma triglyceride, cholesterol (CHOL), lipoprotein fractions as well as PAI-1, C-reactive protein (hs-CRP), fibrinogen and cytokine (adiponectin, TNF- $\alpha$  and IL-6) levels were determined. Plasma glucose, free fatty acid (FFA) and insulin responses to an oral glucose tolerance test (OGTT) were measured.

**Results:** At baseline, postmenopausal women were characterized by lower lean mass and higher HDL-CHOL concentrations ( $0.01 < p < 0.02$ ), compared to premenopausal ones. After walking, estimated  $\dot{V}O_{2\text{max}}$  was improved in both groups ( $0.0001 < p < 0.002$ ). However, body weight and fat mass ( $0.0003 < p < 0.03$ ), plasma CHOL and LDL-CHOL levels ( $0.008 < p < 0.01$ ) decreased in premenopausal women, while plasma TNF- $\alpha$  and PAI-1 levels ( $p=0.006$ ) increased in postmenopausal subjects. Plasma levels of hs-CRP, fibrinogen and others adipocytokines as well as glucose, insulin and FFA areas under the curve (OGTT) remained unchanged in both groups ( $0.21 < p < 0.77$ ).

**Conclusion:** Our walking program reduces adiposity and improves some features of premenopausal women's metabolic risk profile, only.

## T2:PS:94

**Obesity management as part of primary care medicine – results of a three year experience in a german practice**

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**Introduction:** Primary care medicine needs to address the rising epidemic of overweight and obesity. This is especially prudent since behavioral factors are often learned and perpetuated in families. In Germany, only few practices have started to address this issue. We report three-year results of an urban primary care practice.

**Concepts and methods:** Since 2003 a six-month weight control program was built up in accordance with current guidelines: 4 weekly meetings, followed by monthly sessions for 5 months. Additional monthly sessions are offered as needed. The program is led by an internist qualified in nutritional medicine/psychotherapy as well as a nutritionist/sports teacher. The meetings are held in the practice's seminar room. Patients are motivated during regular office visits.

**Results:** From 2003 thru 2007 a total of 157 patients started the program. The majority of participants were females (79%) with a mean age of 56 years (span 16-86). The drop out rate was 15%. So far, follow-up data after one year or more were obtained for 79 patients. The maximum follow-up time was 47 months. The mean body mass index when starting was 32.9 (SD 6.3). Average weight loss was -4.4 kg (span: - 41,3 to + 8 kg). More than 10% weight loss was observed in 28% of patients. Additional 18% lost more than 5% body weight.

**Conclusions:** An obesity management program can successfully be implemented in a primary care setting. Yet, to our experience, special attention needs to be given to the longterm doctor-patient relationship if weight lossing is not successful.

**T2:PS:95****Conclusions from nonpharmacologic treatment of morbid obesity with an example of 250 kg body weight loss**

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For the treatment of morbid obesity surgical methods are recommended but in cases of contraindication treatment by nonpharmacologic methods are possible.

**Aim:** Evaluation of the effectiveness of the nonpharmacologic method in weight reduction

**Method:** Underwater exercise, gymnastic, brisk walking controlled by step counter, LCD.

**Subjects:** 88 morbid obese inpatients BMI: 0: 47.59 kg/m<sup>2</sup> age: 45.3y (SD:10.2) time of treatment 0:23.5 days (SD: 14.54) median:18.0 days.

**Results:**

Body weight (kg)	BMI (kg/m <sup>2</sup> )	waist circ (cm)	VFA (cm <sup>2</sup> )
138.83 (SD:22.30)	47.59 (SD:6.69)	135.95 (SD:12.87)	206.87 (SD:63.56)
131.06 (SD:21.27)	44.93 (SD:6.54)	129.79 (SD:12.16)	196.19 (SD:53.60)

Fat mass (kg)	RRsyst (mmHg)	RRdiast (mmHg)	hCRP (mmol/l)
65.14 (SD:15.72)	151.53 (SD:19.50)	90.90 (SD:13.46)	12.32 (SD:9.14)
60.12 (SD:15.86),	126.45 (SD:11.27)	78.59 (SD:7.54)	7.59 (SD:5.16)

glucose (mmol/l)	cholesterol (mmol/l)	LDL - chol (mmol/l)	triglyceride (mmol/l)
6.65 (SD:2.37)	5.27 (SD:1.07)	3.19 (SD:0.90)	2.43 (SD:1.59)
5.30 (SD:1.39)	4.61 (SD:1.04)	2.69 (SD:0.88)	1.76 (SD:0.69)

Significant difference has been observed between all before and after treatment values. The method is illustrated with a 250 kg weight loss in a multimorbid case.

**Conclusion:** Our nonpharmacologic complex short-term treatment is suitable for significant body weight loss in morbid obesity.

**T2:PS:97****Prevalence of overweight and obesity in pregnant women in Belgium**Vansant G<sup>1</sup>, Guelinckx I<sup>1</sup>, Mullie P<sup>1</sup> Devlieger R<sup>2</sup>

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Maternal pregravid obesity is a significant risk factor for adverse outcomes during pregnancy. Therefore, the increasing prevalence of obesity in young women is a major public health concern

**Study Design:** In a retrospective cohort study, all women attending the antenatal clinic during the year 2006 were included. Total number of deliveries was 2152; complete data were available for 1863 women. Body weight and height before pregnancy were self-reported. Women were classified according to WHO standards as underweight (BMI < 18.5 kg/m<sup>2</sup>), normal weight (BMI: 18.5-24.9), overweight (BMI 25.0-29.9) and obese (BMI ≥30). Mean age did not differ between the groups (30 ± 5 years)

**Results:** 5.8% of the women were underweight and 64.8% presented with normal BMI before pregnancy. Overweight was present in 20.7% and obesity in 8.7% of the study population. BMI in the total group ranged from 15.4 to 52.1 kg/m<sup>2</sup>. 24% of the total population underwent a caesarean section, starting from 20% in the lowest BMI category to 33% in the obese group. Induction of labour was necessary in 38% of the underweight women, 42% in the normal BMI group, 48% for the overweight, 58% in the obese women and increasing even to 68% in the morbid obese (p<0.005). Pregnancy duration, and other obstetric and perinatal outcomes did not differ between the groups.

**Conclusion:** The prevalence of overweight/obesity in pregravid Belgian women is even higher than those reported in literature. Perhaps, the selection at a university hospital may results in a slightly overreporting of the problem.

**T2:PS:96****A nutrition intervention program in psychiatric patients taking antipsychotics**

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**Introduction:** Psychotropic drugs are frequently associated with weight gain. Typical antipsychotics that have been recently released have better results when treating the disease, but the problem of weight management still remains and the prevalence of the metabolic syndrome in psychiatric patients is constantly increasing. A long term nutrition intervention program in psychiatric patients has been carried in Greece, based on the traditional Mediterranean diet, in combination with personalized exercise counseling, in order to control the increase in body weight.

**Methodology:** 265 psychiatric patients (mean age 39,5±10,9 years) participated in the study (220 women and 45 men). Anthropometric measurements (body weight, % body fat, waist circumference), measurement of Basal Metabolic Rate (BMR), clinical (type of disease and medication) and biochemical data (HDL cholesterol, triglycerides etc) were collected. Dietary assessment was also carried out. A personalized diet was given for weight control in each patient by a dietitian. The patients were visiting the dietitian every two weeks. Results were analyzed after three and six months of intervention. The statistical analysis was processed with SPSS.

**Results:** According to the results, mean BMI of the participants was 34,8±7,3 and mean % body fat was 39±7,7%. A percentage of 33,8% of the participants had metabolic syndrome. The mean body weight decrease was 5,03±4,2Kg, after three months and 9,48±4,52Kg after six months. The mean % body fat decrease was 2,57±2,34Kg, after three months and 4,47±2,96Kg after six months. Mean waist circumference and waist to hip ratio decreased. Total cholesterol, triglycerides and LDL mean values also decreased.

**Conclusion:** In conclusion, the nutrition intervention program in psychiatric patients has been very successful in reducing body weight and treating the metabolic syndrome.

**T2:PS:98****Dietary patterns in obese women with binge eating disorder before and after weight loss**Gudelj RJ.<sup>1</sup>

<sup>1</sup>Institute of Public Health of Serbia "Dr Milan Jovanovic Batut", Belgrade, Serbia

**Objective:** Aim of the paper was to evaluate dietary patterns in obese women with binge eating disorder (BED) before and after weight loss.

**Method:** Study included 105 women, aged 32.0 ± 7.6 years who addressed outpatient Nutrition Unit for nutrition counseling because of obesity. Nutritional status was defined by Body Mass Index (BMI). The Eating Attitudes Test (EAT-26) standardized for use in Serbian population was used for evaluating symptoms and attitudes associated with disordered eating. Structured Clinical Interview for DSM-IV (SCID-clinical version) was used for diagnosis of BED. Data on dietary intake were obtained pretreatment and posttreatment. Follow-up period was three months.

**Results:** Using the cut-off point of 20 in the total EAT, 32 women (30.47 %) exhibited disordered eating behavior and 30 women (28.57%) met diagnostic criteria for BED. Before weight loss BED group reported greater average energy intake, including nonbinge days. After weight loss there was no significant difference between BED and non BED group regarding energy intake. Weight loss was higher in non BED group. BED group consumed more energy dense food items and sugar rich beverages in comparison to non BED group. Number of meals and snacks from pretreatment to posttreatment increased significantly in both groups.

**Conclusion:** Educative programmes regarding healthy patterns of dieting and eating attitudes are necessary for treatment of obesity and eating disorders. Results suggest that obese women with BED respond well to standard weight loss treatment program with improvements in binge eating behaviours.

## T2:PS:99

## Humans' Weight Response to Histaminergic Manipulations

Barak N

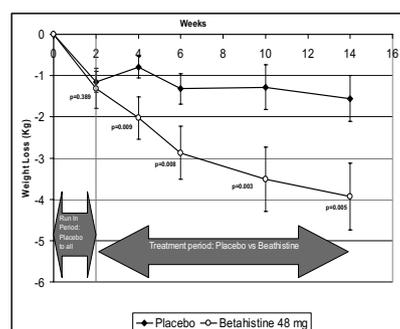
Obecure Ltd

**Objective:** To determine what affects human's magnitude of weight loss when exposed to Betahistine, a centrally acting Histamine H1 agonist.

**Design:** Post hoc analysis of BET-201, a multicenter, multiple dose, phase 2 study, that investigated the potential of Betahistine to serve as an antiobesity agent.

**Results:** After the run-in period, 281 subjects were assigned randomly to treatment or placebo, and a total of 234 (83.3%) subjects completed the study. The post hoc exploratory subgroup analysis includes 118 subjects that compose the per protocol population of the Placebo group and the Betahistine high dose group. This analysis revealed that the factors affecting weight response in the Betahistine group were age, ethnicity, gender, and weight loss during the run in period. For age, the cut off for having a good response to the drug was 50 years of age. For gender, women responded better to the drug than men, for weight loss during the run in period, the cut off was 1.5 Kg. For ethnicity, non Hispanics responded better than Hispanics. Race had no effect on the response to the drug. The per protocol population of less than 50 years old, non Hispanic women a statistically and clinically significant weight loss was observed, the Betahistine group (n=23) lost  $-4.24 \pm 3.87$  Kg while the placebo group (n=25) lost  $-1.65 \pm 2.96$  Kg during this time period ( $p=0.005$ ).

**Conclusion:** Histaminergic manipulations may induce weight loss in a subset of patients. Data from animals showed a relation between sex hormones and weight response to histamine, and our data suggests a similar response in humans.



## T2:PS:101

## Effect of sibutramine on lipid levels in statin treated and untreated obese patients

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Previous studies showed positive effect of sibutramine on lipids compared to placebo. Today many obese patients are using statin and the sibutramine statin interaction was not evaluated yet.

The aim of the study was to evaluate effect of 15mg sibutramine on lipid level in 44 obese patients- mean age 50.8 years, mean BMI 37.2 kg/m<sup>2</sup>, mean weight loss -6.7 kg/ 3 months. 18 patients continued the stable statin dose combined with new sibutramine therapy. 26 newly sibutramine treated patients had no hypolipidemic therapy. We are evaluating the first 3 months of sibutramine therapy using paired Wilcoxon nonparametric test. Results: Lipid levels changed in the following way: cholesterol 5.18...4.96 mmol/l ( $p = 0.02$ ), LDL cholesterol 2.98...2.90 mmol/l ( $p = 0.29$ ), HDL cholesterol 1.18...1.25 mmol/l ( $p = 0.001$ ), triglycerides 1.89...1.69 mmol/l ( $p = 0.04$ ). Comparing both groups there was no significant difference in statin treated and untreated patients. The lipid change was the same in both groups- total cholesterol ( $p = 0.86$ ), LDL cholesterol ( $p = 0.97$ ), HDL cholesterol ( $p = 0.18$ ) and triglycerides ( $p = 0.27$ ). Nearest to significance was the HDL cholesterol change: without statin +0.06 mmol/l and with statin +0.12 mmol/l and triglycerides without statin -0.35 mmol/l and with statin -0.09 mmol/l. Significant changes of blood glucose and HbA1c level were also present without any difference in both groups. Conclusion: Sibutramine effectively decreases triglycerides and total cholesterol level and increases HDL cholesterol level in 3 month therapy. The effect is the same in statin treated patients. The sibutramine effect on HDL cholesterol could be even bigger in statin treated patients. This effect has to be confirmed in longer studies. It is useful to use sibutramine effect on lipids even in obese patients with established statin therapy.

## T2:PS:100

## Psycho-markers of weight loss; the influence of TFEQ Disinhibition and Restraint on the role of exercise in effective weight management

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Eating behaviour traits, namely Disinhibition and Restraint, exert a powerful effect on food intake and energy balance (Bryant et al, 2008). For example, Disinhibition is associated with a susceptibility to gain weight (Haynes et al, 2005). The effectiveness of exercise as a method of weight management could be moderated by these traits. This study examined the relationships amongst exercise, eating behaviour traits, and weight loss. Fifty eight overweight and obese men (n=19) and women (n=39) with mean BMI=31.8 ±4.5 kg/m<sup>2</sup>, age=39.6 ±9.8yrs and VO<sub>2max</sub>=29.1 ±5.7ml/kg/min completed 12 weeks of supervised exercise. The Three Factor Eating Questionnaire (TFEQ) was administered, and body weight (Bwt), waist circumference (WC) and fat mass (FM) measured at weeks 0 and 12. After 12 weeks Bwt and FM decreased significantly by -3.3 ±3.6kg, and 3.3 ±2.6kg respectively ( $p<0.001$ ). Twelve weeks of exercise and a significant reduction in body weight resulted in a significant decrease in Disinhibition (18%) and increase in Restraint (21%). TFEQ hunger did not change. Baseline (week 0) Disinhibition was significantly correlated with changes in Bwt ( $r = -0.290$ ,  $p= 0.029$ ), and WC ( $r = -0.339$ ,  $p=0.010$ ). The change in Disinhibition was significantly correlated with changes in Bwt ( $r=0.371$ ,  $p=0.004$ ), WC ( $r=0.387$ ,  $p=0.003$ ) and FM (0.313,  $p=0.021$ ). 12 Weeks of exercise-induced weight loss resulted in changes in Disinhibition and Restraint. Disinhibition and Restraint are psycho-markers for the effectiveness of exercise on body weight and body composition. Exercise can be an effective form of weight control for people susceptible to further weight increase because of high Disinhibition.

This project was funded by the Biotechnology and Biological Sciences Research Council (BBS/B/05079).

## T2:PS:102

## Treatment of obese with low calorie diet (lcd) for 6 months - clinical effect

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**Aim:** To analyse effectiveness and clinical outcome of treatment of obese using low calorie diet.

**Methods and sample:** Sample consists of 100 obese patients with comorbidities aged ( $47.2 \pm 12.7$  years, 21-74), recruited randomly from patients of Centre of obesity treatment during their first visit. Patients were asked for informed consent with the study, examined (for anthropometric parameters, biochemical parameters from fasting plasma and urine sample from 12 hour diuresis, 24-hour dietary recall), educated in desirable regime changes - especially in LCD (1200 kcal/day). Like biomarkers of prescribed diet and content of vegetable and fruit intake, urine excretion of phenolic compounds was measured. Patients were monthly supervised by nutritionists and after 3 and 6 months examined in the same manner like on the beginning. Wilcoxon's pair test was used for statistical analyse.

**Results:** After 3 months of therapy only 51 patients and after 6 months only 36 patients remained on the regime treatment with weight loss effect, rest escape from the study or needed complementary treatment. Weight loss after 3 and 6 months was statistically significant with median on the beginning 112.4 kg (Q<sub>1</sub>103.4; Q<sub>3</sub>131.0) vs median at time 3 months 105.9 kg (Q<sub>1</sub>93.0; Q<sub>3</sub>126.0) and 110.5 kg (Q<sub>1</sub>99.8; Q<sub>3</sub>133.0) vs 103.6 kg (Q<sub>1</sub>91.1; Q<sub>3</sub>119.4) in 6 months respectively, together with statistically significant decrease of AST, ALT, GMT, uric acid, total and LDL cholesterol, triglyceride, glucose, CRP plasma level, and microalbuminuria.

**Conclusion:** Study has shown measurable clinical success of LCD at minimum in one third of patients.

Research relating to this abstract was funded by MSM 0021620819

**T2:PS:103****Factors affecting patients' dropout in a weight management program for metabolic syndrome**Valourdou S<sup>1</sup>, Fappa E<sup>1</sup>, Pitsavos C<sup>2</sup>, Skoumas Y<sup>2</sup>, Sarra K<sup>1</sup>, Yannakoulia M<sup>1</sup>, Stefanadis C<sup>2</sup><sup>1</sup>Department of Nutrition and Dietetics, Harokopio University, Athens, Greece  
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Aim of the study was to explore potential factors affecting attendance and dropout, and consequently, adherence in a weight reduction lifestyle program for patients with metabolic syndrome (MS). Forty nine MS patients (51 % women, mean age: 47±24 years), attending an outpatient clinic in a major general public hospital, were randomly assigned to a Less Intensive (LI, 4 individualized, goal-oriented counseling sessions) or a More Intensive care (MI, 9 individualized, goal-oriented counseling sessions) 6-month intervention. All participants underwent a standard clinical, biochemical and lifestyle examination at baseline and at 6-month follow-up. No statistically significant differences were detected between the two groups in none of the baseline parameters evaluated. Twenty-one patients (42.8% of the total sample) quitted the program and they were classified as dropouts. Discriminant analysis revealed that type of intervention ( $\lambda=0.834$ ), waist circumference ( $\lambda=0.937$ ), years of education ( $\lambda=0.968$ ), blood triglycerides levels ( $\lambda=0.975$ ) and sex ( $\lambda=0.987$ ) were the most important factors affecting patients' dropout. Logistic regression further demonstrated that MS patients who participated in the MI ( $p=0.01$ ) and those with lower waist circumference ( $p=0.04$ ) were more likely to complete the program. These preliminary findings indicate that baseline participants' characteristics related to the MS (such a waist circumference) as well as intervention characteristics (intensity of the program in terms of number of counseling sessions) may affect patients' dropout, and possibly management of MS factors.

**T2:PS:105****A randomized trial of a low-carbohydrate vs a very low calorie diet**Rolland C<sup>1</sup>, Hession M<sup>1</sup>, John O<sup>1</sup>, Murray S<sup>2</sup>, Wise A<sup>1</sup>, Broom J<sup>1</sup>.<sup>1</sup>Robert Gordon University, Aberdeen, Scotland; <sup>2</sup>LighterLife, Harlow, UK

Long term efficacy of low-carbohydrate and very low calorie diets and their potential to improve cardiovascular risk factors still remain unclear.

In an ongoing randomized controlled trial, 120 obese patients underwent a screening period during which they were assigned to a healthy eating low calorie diet for a period of 3 months. Patients who achieved a 5% weight loss at 3 months were continued with this approach while the other patients were randomized to a low-carbohydrate (protein sparing modified fast –PSMF) or a very low calorie commercial diet (LighterLife - LL). Here we present data for 3 months post-randomization.

Of the initial 120 patients, 72 were randomized. Subjects on the LL ( $n=35$ ) lost significantly more weight than patients on the PSMF ( $n=37$ ) ( $-11.2$  SD  $12.9$  vs.  $-2.9$  SD  $4.5$ ,  $P=0.01$ ), and had a greater improvement in low-density lipoprotein cholesterol ( $-0.25$  SD  $0.56$  vs.  $0.03$  SD  $0.36$ ,  $P=0.015$ ). Patients on LL had significantly greater improvement in total cholesterol and fasting glucose concentration but significance was lost when corrected for differences at baseline.

Patients on LL had a significant improvement in blood pressure, fasting glucose and HbA1c between randomization and 3 months. However, there were no significant differences between changes in LL and PSMF for blood pressure, triglycerides, high-density lipoprotein cholesterol and fasting HbA1c concentrations at 3 months.

Both dietary approaches achieved significant weight loss. The LL diet produced a greater weight loss than did the PSMF for the first 3 months. The LL diet was associated with greater improvement in some risk factors for cardiovascular disease.

**Funding:** Research relating to this abstract was funded by LigherLife

**T2:PS:104****Eating Inventory and metabolic risk factors in obese women before and after weight loss**Hainer V, Hlavata K<sup>1</sup>, Gojova M<sup>2</sup>, Kunesova M<sup>1</sup>, Wagenknecht M<sup>1</sup>, Kopsky V<sup>1</sup>, Parizkova J<sup>1</sup>, Hill M<sup>1</sup>, Nedvidkova J<sup>1</sup><sup>1</sup>Institute of Endocrinology, Prague, Czech Republic and <sup>2</sup>Lazne Lipova, Obesity Management Unit, Czech Republic

**Background and aims:** Factors of the Eating Inventory (EI) were revealed as significant predictors of diseases characterizing the metabolic syndrome. The aim of the study was to evaluate association of the items of the EI with metabolic risk factors, adiponectin and neuropeptide Y (NPY) both before and after the weight reduction.

**Methods:** Four-week in-patient comprehensive weight reduction program was introduced. Food intake and physical activity were strictly controlled. Women ( $n=67$ , BMI:32.4±4.4 kg; age:48.7±12.2 years) who maintained stable weight on a 7MJ/day diet during the 1st week of weight management were given a hypocaloric diet characterized by daily energy deficit of 2.5 MJ over the subsequent 3-week period. This treatment resulted in a mean weight loss of  $3.80 \pm 1.64$  kg. Association of the items of the EI (restraint:RES, disinhibition:DIS, hunger:HUN) with lipid profile, fasting blood glucose (FBG), C peptide (CP), insulin, adiponectin and NPY were determined before and after weight loss.

**Results:** No significant relations of the EI factors with lipid and glucose profiles and hormone levels were observed before weight reduction. After weight loss RES was associated with FBG ( $r=-0.327, p=0.007$ ), CP ( $r=-0.268, p=0.038$ ), insulin ( $r=-0.336, p=0.006$ ) and NPY ( $r=-0.242, p=0.05$ ). HUN was positively related to insulin ( $r=0.256, p=0.038$ ) and NPY ( $r=0.289, p=0.019$ ). DIS correlated with total cholesterol ( $p=0.284, p=0.021$ ), LDL cholesterol ( $r=0.257, p=0.037$ ), triglyceride ( $r=0.265, p=0.032$ ), NPY ( $r=0.274, p=0.026$ ) and adiponectin ( $r=-0.335, p=0.006$ ) levels.

**Conclusions:** Significant relationships between individual items of EI and metabolic risks were revealed in obese women after weight loss resulting from 2.5 MJ deficit in their diet applied for 3 weeks.

Supported by grant IGA NR 7800-4

**T2:PS:106****Baseline differences between achievers and non achievers of weight loss in a 3 month period with a healthy eating weight loss regimen**Rolland C<sup>1</sup>, Hession M<sup>1</sup>, John O<sup>1</sup>, Murray S<sup>2</sup>, Wise A<sup>1</sup>, Broom J<sup>1</sup><sup>1</sup>Robert Gordon University, Aberdeen, Scotland; <sup>2</sup>LighterLife, Harlow, UK

Determining the factors that predict whether a person will achieve a 5% weight loss using a healthy eating diet (HE) could lead to a more effective, personalized treatment of their obesity.

In an ongoing randomized controlled trial, 120 obese patients underwent a screening period during which they were assigned to a HE for a period of 3 months. Patients aimed to achieve at least a 5% weight loss at the end of the 3months. We investigated baseline differences between those who did and did not achieve the weight loss target. At baseline and 3 months patients underwent measurements for body composition, cardiovascular risk factors and lifestyle questionnaires.

Of the initial 120 patients, 18 (15%) achieved a 5% weight loss, 72 (60%) did not and 30 (25%) dropped out. At baseline, age (47.5 SD 11.0 vs. 41.4 SD 11.8,  $P=0.044$ ) fasting triglycerides (2.0 SD 1.0 vs. 1.5 SD 1.1,  $P=0.007$ ) and total cholesterol/high density lipoprotein (4.6 SD 0.9 vs. 4.0 SD 0.9,  $P=0.012$ ) were significantly different between the achievers and non-achievers, but they did not differ in quality of life, depression, fatigue or activity level.

Patients who dropped out during the 3 month screening period were significantly younger (37.5 SD 10.2 vs. 42.5 SD 12.0,  $P=0.042$ ) than the patients who remained in the study and they scored higher on the Beck Depression Inventory questionnaire (16.8 SD 10.8 vs. 11.9 SD 8.6,  $P=0.014$ ).

Age appears to be an important factor when determining the likelihood of an individual to adhere to a HE. Levels of depression also give an insight as to the likelihood of an individual's success.

**Funding:** Research relating to this abstract was funded by LigherLife

## T2:PS:107

**'Novel' carbohydrates in bars do not enhance satiety**

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Different types of 'novel' carbohydrates have been proposed to reduce hunger by either being slowly digestible themselves (e.g. isomaltulose), or by delaying the digestion of other carbohydrates (e.g., Fibersol™, pullulan) or perhaps by directly increasing satiety hormones (e.g. Nutraflora™). The aim of this study was to assess the satiety value of meal-replacement bars containing these different food-grade carbohydrates. In a 6-way cross-over double-blind randomized design, 24 healthy volunteers (BMI: 21-32 kg/m<sup>2</sup>) consumed at breakfast iso-caloric meal bars: a control bar (Slim-Fast High Protein Granola Bar), bar with addition of 8g Nutraflora™ (a short-chain fructo-oligosaccharide), or 8g Pullulan (a soluble fibre), or 9g isomaltulose (a slowly digestible disaccharide), or 8g Fibersol™ (a resistant maltodextrin). All carbohydrates were accommodated by removing part of the sugars. Self-reports of satiety measures were collected for following 5 hours. All parameters were analyzed using ANOVA and (where appropriate) baseline values as covariates. Results of 5 of the 6 treatments were reported here. When compared to the control, none of the added carbohydrates affected any of the satiety/hunger parameters, when based on single time points or on area-under-the-curve values. However, time-to-return-to-baseline values were significantly improved by pullulan for all satiety parameters except fullness. All test bars were liked significantly less than the control bar. These carbohydrates added to meal replacement bars at the levels tested generally did not affect acute satiety responses. The efficacy of these carbs might be increased by testing them for a longer period or by increasing the level by supplying them twice a day.

**Conflict of Interest/Funding:** all authors are Unilever employees. All research relating to this abstract was funded by Unilever Food & Health Research Institute.

## T2:PS:109

**Meal duration affects the subjective perception of hunger and satiety in a variable manner**

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**Background:** The regulation of hunger and satiety is complex. The possibility that meal duration may affect these processes has not been adequately addressed.

**Aim:** To evaluate possible differences in the subjective perception of hunger and satiety when healthy males consume the same meal at different rates.

**Methods:** Nine healthy male nonobese volunteers (BMI =26.06±4.45 Kg/m<sup>2</sup>, age =29.9±4.1) consumed the same meal (300 ml ice-cream, 675 Kcal) in three sessions of different duration and in random order: In session A the meal was divided and consumed in 5 minutes and in sessions B and C in 30 and 60 minutes respectively. Visual analogue scales (VAS) for assessment of the subjective feelings of fullness and hunger were filled out by all subjects before, during the meal, and at 30 minute intervals for 2.5 hours after the end of the meal. The subjective feelings of fullness and hunger induced by meal consumption for each session were expressed as area under the curve of postprandial VAS measurements adjusted for time (AUC-A, AUC-B and AUC-C).

**Results:** AUC values for the fullness VAS were not significantly different between the three sessions. However, for the hunger VAS they were significantly higher in session C compared to sessions A and B (AUC-C= 23.5 ±7.2 vs AUC-A= 8.5 ±6.4 mm [P=0.08], vs AUC-B= 10.6 ±8.1 mm [P=0.03]). There was no significant difference between AUC-A and AUC-B for the hunger VAS.

**Conclusion:** Meal duration affects the subjective perception of hunger but not that of satiety in healthy male subjects.

## T2:PS:108

**Psychopathology and coping strategies in patients with obesity**

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**Objective:** To describe and compare sociodemographic, psychopathologic factors and coping strategies in obese patients.

**Methods:** We performed a longitudinal study of consecutive outpatients referred to our unit. We classified all patients in two groups: BMI 30 – 39.9 (group 1) and BMI≥40 (group 2). Clinical variables (age, sex, years of obesity history, previous stressing personal events). All patients completed a semistructured interview and BDI (Beck Depression Inventory), STAI (Stay And Treats Anxiety Inventory) and COPE (Coping Strategies) questionnaires. A descriptive and a bivariate analyses were performed. Odd Ratios (OR) and its Confidence Intervals (95%CI) by a logistic regression model were obtained.

**Results:** We included 80 obese patients (80% females, 62.0% in group 2). Mean age were 43 years. 58.3% scored above the normal threshold in depression questionnaire, 44.4% in state anxiety and 66.7% in trait anxiety. No significant differences between groups in all questionnaires evaluated. We observed that patients in group 2 were older (OR=0.95; 95%CI:0.91-0.99), had more years of obesity history (OR=1.09; 95%CI:1.03-1.15), more deaths of relative/friend (OR=5.06; 95%CI:1.5-17.0), more professional dissatisfaction (OR=4.13; 95%CI:1.14-14.94) and more difficulties in emotional venting (OR=3.64; 95%CI:1.18-11.27) than patients in group 1.

**Conclusions:** Significant differences were obtained in coping strategies, and in sociodemographic and psychosocial factors between patients with more obesity. It's important to consider the relevance of high prevalence of psychopathology found. These results show us the necessity of integrating psychocological management in the multidisciplinary approach of obese patients.

## T2:PS:110

**Effect of Olisalvin Omega-3 forte in Metabolic syndrome subjects**

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**Introduction:** The Metabolic syndrome (MetS) is a complex association of several abdominal obesity interrelated abnormalities that increase the risk for cardiometabolic disorders. They can be improved through lifestyle modification and possibly by changing the omega-3/omega-6 ratio in the diet.

**Aim:** To study the effect of polyunsaturated fatty acids (PUFAs) on MetS parameters (IDF 2005 definition).

**Methods:** 30 MetS subjects aged 32 -70 years (13 men and 17 women) were enrolled in a 3- month intervention trial. The treatment protocol included: dietary regimen combined with 1 g PUFAs each day (Olisalvin Omega-3 forte, Actavis®). The following parameters: body weight, fat mass, lipids, fasting plasma glucose, HOMA-IR and plasma adiponectin levels were assessed before and after the treatment period. Eating habits were measured using modified and translated Diet History Questionnaire (DHQ). In addition, stress levels of the subjects were evaluated using validated questionnaires.

**Results:** After 3 months period the lipid levels were lowered. There was an overall decrease of body weight on average between 3 to 1 kilos, which could be explained by the adherence to the dietary regimen. In 36.6 % of all subjects was observed increase of the adiponectin levels.

**Conclusions:** The addition of PUFAs in the complex therapy of the metabolic syndrome modifies positively all risk factors and metabolic disturbances. The use of omega-3 fatty acids could be recommended as a dietary supplementation in reducing the MetS burden, especially in high risk patients.

## T2:PS:113

**Metabolic Effects of Weight Loss on a Very Low Carbohydrate Diet Compared to an Isocaloric High Carbohydrate Diet in Abdominally Obese Subjects**

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CSIRO Human Nutrition

**Objective:** To compare the effects of an energy reduced, isocaloric very low carbohydrate, high fat diet (LC) and a high carbohydrate, low fat diet (HC) on weight loss and cardiovascular disease risk outcomes.

**Background:** Despite the popularity of LC, no long term studies have compared their effects of weight loss and metabolic change to a conventional HC, under isocaloric conditions.

**Methods:** 88 abdominally obese adults were randomly assigned to either an energy restricted (~6-7 MJ, 30% deficit), planned isocaloric LC or HC for 24 weeks in an outpatient clinical trial. Body weight, blood pressure, fasting glucose, lipids, insulin, apoB and C-reactive protein were measured at Week 0 and 24.

**Results:** Weight loss was similar in both groups (LC  $-11.9\pm 6.3$ kg, HC  $-10.1\pm 5.7$ kg;  $P=0.17$ ). Blood pressure, C-reactive protein, fasting glucose and insulin reduced similarly with weight loss in both diets. LC produced greater decreases in triacylglycerol (LC  $-0.64\pm 0.62$ mmol/L, HC  $-0.35\pm 0.49$ mmol/L;  $P=0.01$ ) and increases in HDL-C (LC  $0.25\pm 0.28$ mmol/L, HC  $0.08\pm 0.17$ mmol/L;  $P=0.002$ ). LDL-C decreased in HC but remained unchanged in LC (LC  $0.03\pm 0.79$ mmol/L, HC  $-0.46\pm 0.71$ mmol/L;  $P<0.001$ ). However a higher degree of individual variability for the LDL response in LC was observed, with 24% of individuals reporting an increase of at least 10%. ApoB levels were not significantly different from baseline in either diet group.

**Conclusions:** Under isocaloric conditions a LC and HC result in similar weight loss. Although, differential diets effects on lipid profile were observed, cardiovascular risk markers were improved with both diets. This suggests LC as an option for obesity treatment warrants greater consideration, although monitoring individual responsiveness is prudent.

## T2:PS:115

**Anthropometric measures and cardiovascular risk in obese women**

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Obesity is associated with an increased risk of cardiovascular (CV) events. The aim of this study was to evaluate the relationship between global CV risk (calculated by the Framingham or the Progetto Cuore algorithms) and various anthropometric measures in a cohort of obese women.

We evaluated 162 women, age (mean $\pm$ SD)  $46\pm 8$  years (range 35-65); body weight  $111\pm 18$  Kg (78-185); BMI  $43.4\pm 6.7$  Kg/m<sup>2</sup> (32.1-66.3); waist circumference  $124\pm 14$  cm (93-160); hip circumference  $130\pm 13.9$  cm (105-190); waist-to-hip ratio (WHR)  $0.95\pm 0.08$  (0.73-1.14). Visceral fat thickness, measured by ultrasound, was  $85.5\pm 23.1$  mm (32-160). CV risk, evaluated according to the Framingham algorithm, was  $9.4\% \pm 5.8$ . CV risk evaluated according to the algorithm of Progetto Cuore was  $1.72\% \pm 1.76$ . Among various parameters, WHR was the only measure independently and directly associated with the CV risk (Framingham  $p<0.005$ ; Progetto Cuore  $p<0.05$ ). This association was stronger than that observed between WHR and any of the parameters used to calculate the CV risk.

In conclusion, among Italian obese women the CV risk varies depending on the algorithm used for calculations. The CV risk is not associated with body weight or BMI, suggesting that obesity per se is not a risk factor. WHR appears as the best anthropometric predictor of calculated CV risk, including multiple independent risk factors. These results suggest that in obese women the amount of visceral fat, as well as muscular and subcutaneous adipose mass distribution are associated with the cardiovascular risk. Further studies are needed to clarify the pathogenic and clinical implications of these findings.

## T2:PS:114

**Obesity and actual functioning: the role of adverse childhood experiences**Silva, S<sup>1</sup>, Maia, A<sup>1</sup><sup>1</sup>University of Minho, Braga, Portugal.

**Background:** Clinical data show that obese have more psychopathology and a worse adult functioning than non obese subjects. Bariatric surgery is sometimes unsuccessful to solve overeating and overweighting problems. The aim of our work was to compare obese and non obese subjects and study the prevalence of childhood adversity experiences and psychopathology and understand the relation of the negative events with psychological functioning.

**Method:** 75 morbid obese (bariatric surgery candidates) and sixty-nine non obese filled Social-demographic and Life History Questionnaire, Adult Attachment Scale, Brief Symptoms Inventory, NEO-Five Factor Inventory, Ways of Coping Questionnaire.

**Results:** 88% of the obese participants report at least one type of adverse childhood experience, 59% have psychopathology, and the anxiety attachment dimension is high. Adversity was positively related with psychopathology, attachment dimension "anxiety", neuroticism and negatively with direct coping and explains a significant part of all these dimensions variance. 71 % of the non obese report at least one adverse childhood experiences and have normal scores in all dimensions of actual functioning. Obese report statistically significant more adverse childhood experiences, psychopathology, anxiety and neuroticism and less direct coping.

**Conclusions:** Adverse childhood experiences are a significant predictor of maladaptive functioning in obese adults. Adversity and actual functioning predict psychopathology in obese participants. Considering that overeating can be a coping strategy to deal with negative emotions and emotional problems, these results should be taken in consideration in the evaluation of bariatric surgery candidates and in the post-surgery period. It's also import to *re-think* prevention programs philosophy.

## T2:PS:116

**The effect of diet therapy in Sonographic finding of Non-Alcoholic Fatty Liver Disease (NAFLD).**

Tahaei S

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NAFLD is including a wide range of diseases which progress from simple hepatic steatosis to Non-Alcoholic Steatohepatitis (NASH) and finally to cirrhosis. NAFLD is typically seen in association with Obesity. In order to seek the exact role of diet therapy in treatment of NAFLD, we compare the sonographic results of patients with fatty liver disease before and after one standard diet therapy. 23 patients ( 10 males & 13 females ) with incidental hyperechogenic liver sonography (Fatty Liver) in the case that their BMI is higher than 25 undergone 3 months of diet therapy which within each month the patients' anthropometric data including weight, BMI, Waist, Abdominal and Pelvic Circumferences were evaluated and their diet would have been modified under the supervision of one nutritionist. Their sonographic results categorized to 4 grades based of radiological findings under supervision of one radiologist. At the end we compared the differences between their basic liver sonography and anthropometric data before and after diet therapy. Diet therapy makes the sonographic grades of all patients decreased. 15 patients decrease one grade while the other 8 patients decline 2 grades. There are significant correlations between the rate of decline in sonographic findings and the rate of decrement of weight and BMI. Otherwise we could not find any significant correlation between the degrees of sonographic grade alteration and the rate of decreasing of Waist Circumference, Abdominal Circumference and Pelvic Circumference. Our clinical trial indicates that standard diet therapy would be useful as an effective treatment for NAFLD patients.

## T2:PS:117

**One-year follow up of obese complicated patients over fifties.**

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Treatment of obese complicated patients over fifties represent a main challenge for physicians. In this period of life, there could be important modifications of lifestyle, which might favour the reduction of physical activity, reduced perception of own body image.

The aim was to try to teach to our patients about metabolic and cardiovascular risks linked to obesity and about the possibility to manage this problem, by recovering a better quality of life.

Sixty-six obese women were enrolled. There were no exclusion criteria. In basal conditions and at the end, each subject underwent physical examination, biochemical, hormonal and nutritional evaluations. All subjects received a questionnaire about physical activity and motivation to change. Each subject was then invited to follow collective meetings, in whose different Specialists and a Dietician talked them about obesity and its complications. Moreover each subject performed a self-evaluation of energy and nutrient intake. This approach wanted to exalt the individual capacity to better understand and then manage this problem, through practical exercises, educational games. Fourteen obese women dropped out the study, independently of motivation score, which was statistically not different between the dropp-group and the completer-group. In the completer-group, 84.6% was in polypharmacological therapy, 34.6% was employers and 44% was not working (housewives, pensioners); 60% was married.

After 1-yr follow up, all subjects significantly reduced body weight and waist circumference values. Metabolic parameters significantly improved as well.

Moreover, our patients founded an association promoting both cultural and physical activities, thus leading to a more active social life.

## T2:PS:119

**Comparative study of cholesterol reduction between orlistat 120 mg-placebo, rimonabant-placebo and sibutramine-placebo through a meta-analysis.**

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**Objectives:** The aim of this study was to compare the results obtained from different clinical studies by means of a meta-analysis. The reduction in cholesterol levels in obese subjects treated with orlistat 120 mg, rimonabant or sibutramine compared with placebo were evaluated.

**Methodology:** A total of 27 studies published during the last 5 years were selected. The search was conducted using the following databases: MEDLINE, EMBASE and the Cochrane Controlled Clinical Trials Register.

The selection criteria were: patients at least 18 years old, with a BMI between 27 and 30 kg/m<sup>2</sup> (both bounds included), with one or two comorbidities related to obesity. The studies included were double-blind, placebo-controlled, randomised, of at least 1 year duration, and investigated any of the three medications of interest in the current study.

All the studies were considered good quality, with a Delphi index that was greater than or equal to 5.

**Results:** Orlistat 120 mg use resulted in a large reduction in the levels of total cholesterol (32.84 mg/dl) and LDL-cholesterol (30.61 mg/dl) compared with sibutramine (3.87 mg/dl and 3.36 mg/dl). For rimonabant, cholesterol levels were augmented both in the treated group and the control group.

Regarding HDL-cholesterol, sibutramine and rimonabant use resulted in increases of this cholesterol while the results for orlistat were stable.

**Conclusion:** A statistically significant reduction in total cholesterol and LDL-cholesterol with orlistat 120 mg was detected, while rimonabant and sibutramine did not produce any change after 1 year of treatment.

**Funding:** Research relating to this abstract was funded by Roche Farma S.A

## T2:PS:118

**Comparative meta-analysis to evaluate systolic and diastolic blood pressure in obese patients treated with orlistat 120 mg, rimonabant, sibutramine or placebo**

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**Objectives:** The reduction in systolic (SBP) and diastolic blood pressure (DBP) in obese patients treated with orlistat 120 mg, rimonabant, sibutramine or placebo was evaluated in a meta-analysis.

**Methods:** Randomised, double-blind controlled studies (at least 1 year in duration) were identified through a search of the following databases: MEDLINE, EMBASE and the Cochrane Controlled Trials Registers. Inclusion criteria were: patients  $\geq 18$  years old; with a body mass index of 27–30 kg/m<sup>2</sup>; with one or two comorbidities related to obesity. Studies could include any of the three medications.

**Results:** Twenty seven studies published during the last 5 years were selected. All of the studies were considered to be of good quality (Delphi index at least 5).

The mean reductions in SBP and DBP with orlistat 120 mg were 1.79 mmHg and 2.81 mmHg, respectively (vs. 0.66 mmHg and 1.03 mmHg, respectively, for placebo). For rimonabant these values were 0.61 mmHg and 0.93 mmHg, respectively (vs. 0.21 mmHg and 0.30 mmHg, respectively, for placebo).

An increase in SBP and DBP was observed with sibutramine (mean change, -4.35 mmHg and -1.64 mmHg for SBP and DBP, respectively, vs. 0.15 mmHg and -0.48 mmHg, respectively, with placebo).

**Conclusion:** Orlistat 120 mg reduces arterial pressure more effectively than rimonabant and sibutramine. Orlistat 120 mg not only reduces weight but also reduces the probability of acquiring the cardiovascular risk factor hypertension.

**Funding:** Research relating to this abstract was funded by Roche Farma S.A

## T2:PS:120

**Metabolic syndrome and nutritional behaviors on a rroman population**

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**Rationale:** Last decades epidemiological studies made the evidence of a variety of factors closed linked with obesity. These factors were classified by Siedel, 1995: demographical, socio-cultural, biological, behavioral factors.

The aim of the study is to analyze the obesity and metabolically complications (cardiovascular disease) in an rroman population of Grajduri, Iasi County, compared to the Romanian population with the same location.

**Methods:** We focused the study on a population with ethnical particularities and high incidence of abdominal obesity. We compared the prevalence of obesity, cardiovascular risk factors and eating behaviors on an rroman population of Grajduri.

We realized a cross-sectional study of two groups of population: -Group 1 – the witness group – 100 Romanians and -group 2 – the study group – 60 Romans.

**Results:** The high values of abdominal perimeter (AP) were associated with metabolic disturbances and a higher evidence of cardiovascular risk factors clustering in rroman population.

The eating behaviors were investigated with a questionnaire focused on the rhythm of eating of cereals, meat, vegetables, fruits, weekly with different variants of answer.

**Conclusions:** For a well recognition of social status, beginning with, 60s, a part of rroman population was established in Grajduri. The priority of the group was to mandate the life style of the local population but incompletely: excessive eating, sedentary lifestyle, so on.

The difficulty of separate habits of costumes that defines alimentary lifestyle is the main characteristic of this group. There is a bad adhesion to the education of healthy lifestyle.y

## T2:PS:121

**What's causing the obesity epidemic – the case for overeating as a form of substance abuse.**Pretlow, R<sup>1</sup><sup>1</sup>eHealth International, Seattle, Washington, USA

Generally accepted causes for the obesity epidemic include: 1) genetics (“thrifty” gene, weight set-point) and 2) environmental factors (widely-available high-calorie food, sedentary lifestyle).

A genetic drive to consume as many calories as possible should cause individuals to overeat both low and high calorie foods, which is not the case. And the environmental theory is analogous to claiming that alcoholism, smoking, and drug addiction are all caused by the environment.

Compelling evidence points to overeating as a form of substance abuse. This appears to be a significant contribution to the obesity epidemic. Food is used as a stress coping mechanism (comfort eating, displacement activity), for self-medication (depression, anxiety), and for entertainment (to combat boredom). It has been argued, “Everyone eats for comfort and entertainment. That doesn’t imply that it’s causing obesity.”[1]. One might drink a glass of wine to relax, but many unintentionally drink until intoxicated or until they become alcoholics. The same is true for food.

Food qualifies as an “addictive substance” per FDA criteria. The food industry openly markets psychological benefits of food (“comfort in every bar” – milkywaybar.com). In *The State of Stress in America*, 48% of respondents report that stress has increased over the past five years. 43% overeat when under stress. Foods eaten under stress almost exclusively are high pleasure foods, ‘junk foods’. 41,000 postings on an overweight youth web forum and 65 online surveys support psychological food dependence.

Obesity should be treated similarly to other forms of substance abuse, by “sequential detox-withdrawal” from abused foods, followed by close long-term support.

1. Hill, J., NAASO Annual Meeting, Boston, 2006

## T2:PS:123

**Effect of a short term moderate-intensity exercise intervention on blood pressure, metabolic and inflammatory markers in Hispanic obese adolescents**Guizar, J<sup>1</sup>, Linares, B<sup>2</sup>, Amador, N<sup>1</sup>, Barbosa, G<sup>2</sup>, Malacara, J<sup>2</sup>, Nuñez, E<sup>2</sup>.

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<sup>2</sup> University of Guanajuato, Mexico.

**Background:** Obesity is a prevalent metabolic disorder in large parts of the developing world and is associated with a chronic inflammatory response, which has been proposed to have an important role in cardiovascular disease.

**Objective:** To evaluate at short term the effects of a moderate intensity physical activity program on blood pressure, metabolic and proinflammatory markers in obese Hispanic adolescents.

**Material and Methods:** We performed a longitudinal study in 43 asymptomatic volunteers’ obese adolescents (26 female and 17 male). All subjects were submitted to aerobic exercise training during 90 minutes for 16 weeks, 5 days per week. Before and after exercise training, hemodynamic, metabolic and inflammatory parameters were measured.

**Results:** Body weight was reduced by 4%. Blood pressure, insulin, C reactive protein, interleukine 6, intracellular adhesion molecule-1 and vascular cell adhesion molecule-1 significantly decreased whereas adiponectin levels increased. In the multiple regression analysis, change in adiponectin and adiposity were related to change in systolic blood pressure levels ( $R^2= 0.26$ ;  $p=0.001$ ), whereas final maximum  $O_2$  consumption rate and final systolic blood pressure levels were related to decrease in C reactive protein levels ( $R^2= 0.79$ ;  $p=0.0001$ ).

**Conclusions:** A short-term, moderate-intensity of aerobic exercise significantly diminished adiposity, blood pressure, metabolic, and inflammatory markers in Hispanic obese adolescents who are especially prone to develop metabolic and hemodynamic complications.

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## T2:PS:122

**Hypertriglyceridaemic waist in post-menopausal women with type 2 diabetes mellitus.**Balasingam M<sup>1</sup>, Bhat S<sup>2</sup>, Umakanth S<sup>2</sup>, Teik Hin T<sup>1</sup>

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<sup>2</sup> Melaka-Manipal Medical College, Melaka, Malaysia

**Background:** Increased waist circumference has been demonstrated to be causatively associated with hypertriglyceridemia. However, no results are available in postmenopausal diabetic women about this relationship in our population.

**Objectives:** To evaluate the relationship between waist circumference and serum triglyceride levels in post menopausal women with type 2 diabetes mellitus.

**Patients and methods:** 95 postmenopausal women with type 2 diabetes mellitus, none of whom were on hormone replacement therapy were chosen for the study. Apart from their basic data, anthropometric measurements and complete fasting serum lipid profile estimation was performed. Data was analyzed using the SPSS™ for Windows version 12.0.

**Results:** While serum triglycerides increased with increasing waist circumference, there was no statistically significant correlation between waist circumference (WC) and serum triglyceride (TG) levels (WC  $89.8\pm 14.5$ cm, TG  $1.97\pm 1.2$ mmol/L, Pearson correlation 0.116,  $p=0.26$ ). Subgroup analysis was also performed based on waist circumference and similar results were observed.

**Conclusion:** The results indicate a statistically insignificant correlation between waist circumference and serum triglyceride levels. While this is difficult to explain, dietary factors may be contributing to this situation. This requires a larger study to confirm these initial findings and investigate the possible reason for this.

## T2:PS:124

**Efficacy and Safety of Phentermine / Low-dose Topiramate Combination Therapy in Obese Men**Park Y<sup>1</sup>, Sung EJ<sup>2</sup>, Jang YS<sup>3</sup>

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**Background:** Topiramate has been associated with dose-dependent weight loss in obese subjects. Object: To investigate the efficacy and safety of combining low-dose topiramate with phentermine in the treatment of obese patients.

**Methods:** Fifty obese (body mass index  $\geq 30$ kg/m<sup>2</sup>) male patients, aged 20y~55y, were included. After 4-week non-pharmacological programs, subjects were randomly assigned to a phentermine group (PHN 37.5mg) and a phentermine-topiramate combination group (PHN 37.5mg-TPM 50~100mg). All subjects were advised to follow a fixed calorie diet (1,500 kcal/d). In the PHN-TPM group, topiramate was started on 25mg/d, and the dosage increments by 25mg every other week until 100mg/d. If an intolerable adverse event occurred, the dosage decreased to the previous level. Dosing was continued for 12 weeks.

**Results:** Forty-three subjects completely satisfied the 12-week study protocol. In a per protocol analysis, mean changes in body weight and waist circumference for PHN-TPM were  $-8.0\pm 2.7$  kg (PHN  $-5.9\pm 2.5$  kg,  $P=0.012$ ) and  $-8.3\pm 3.3$  cm (PHN  $-6.1\pm 3.6$  cm,  $P=0.043$ ), respectively. In a safety analysis, the frequency of adverse reactions were 88.5% (23 of 26 subjects) for PHN-TPM and 70.8% (17 of 24 subjects) for PHN without clinical significance ( $P=0.164$ ). Three subjects in PHN-TPM and one in PHN stopped medication due to adverse effects. Serious adverse reactions or complications were not found.

**Conclusion:** Combining low-dose topiramate with phentermine showed more weight reduction than phentermine only without significant drug reactions.

## T2:PS:125

**Depression and anxiety in very obese patients in an outpatient program in the Reykjalundur Rehabilitation Centre in Iceland.**

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Division of Obesity, Reykjalundur Rehabilitation Centre, Iceland.

The aim of our study was to evaluate depression and anxiety among patients entering our outpatient program for very obese patients. We used Beck's Depression Inventory (BDI) and Beck's Anxiety Inventory (BAI). The BDI consists of 21 questions, with scores ranging from 0 to 63. The BAI consists of 21 questions, also with scores ranging from 0 to 63. During 2004 and 2005 a total of 61 patients (49 women and 12 men) answered the BDI and BAI questions. The average age was  $41 \pm 10$  years and the average body mass index (BMI) was  $46.7 \pm 5.6$  kg/m<sup>2</sup>. We defined depression if the BDI score was  $\geq 10$  and/or patients were using anti-depressants. We defined anxiety if the BAI score was  $\geq 8$ . Of the 61 patients examined, 11 had normal scores, but 50 patients were depressed and/or had anxiety problems. The mean BDI score for depressed patients (N= 43) was  $26.7 \pm 12.0$  and for patients with anxiety (N=35) the mean BAI was  $20.7 \pm 11.1$ . These scores are comparable to scores for patients entering psychiatric treatment for these problems. We conclude that depression and anxiety were common among the very obese patients in our study. This finding should be taken into account when organizing treatment for very obese patients.

## T2:PS:127

**Effect of food matrices on uptake characteristics of conjugated linoleic acid**Spät S.<sup>1</sup>, Schulz C.<sup>2</sup>, Weidner C.<sup>1</sup>, Bell D.<sup>1</sup><sup>1</sup>Cognis Germany GmbH, Mohnheim, Germany  
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While CLA, conjugated linoleic acid, as a dietary supplement for weight management is already sold and clinically proven for more than 10 years, it is not until recently that consumers have the choice to buy CLA also as fortified foods. Despite being on the market, little is known about bioavailability properties of two main isomers c9, t11- and t11, c12-CLA and the influence of food matrix to absorption characteristics.

In a randomized clinical trial with 12 volunteers, bioavailability of nearly equimolar mixtures of c9, t11-CLA and t10, c12-CLA was compared in a three way-cross over design: capsules (1) versus a new water-soluble microemulsion of CLA prepared in juice (2) versus CLA prepared in yoghurt (3). Pharmacokinetic parameters were assessed after single doses of 6.4 g CLA. The two isomers c9, t11-CLA and t10, c12-CLA showed highly parallel concentration-curve progression, reflecting their relation in the test products. The concentration time curves differed significantly between CLA out of food matrices versus capsules: time to reach C<sub>max</sub> levels was significantly shorter after uptake of juice ( $2.0 \pm 0.1$ h;  $p < 0.001$ ) and yoghurt ( $2.1 \pm 0.4$ h) versus capsules ( $4.9 \pm 1.4$ h;  $p < 0.01$ ). For both isomers, C<sub>max</sub> levels were significantly higher after ingestion of CLA in juice ( $p < 0.01$ ) and yoghurt ( $p < 0.05$ ) in comparison to capsules. Higher and faster maximum concentrations of CLA in plasma can be obtained both with dairy and non-dairy food matrices. As first clinical data and post-launch monitoring data from CLA fortified foods implement, effective dosages might be lower than in capsules.

## T2:PS:126

**Association of Sleep Hours and Obesity in Korean Adult Women**

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**Background:** The amount of sleep has recently been added to risk factors for obesity, but studies on this topic are fairly limited in Korea. We studied the relationship between the amount of sleep and obesity based on body mass index (BMI) and percent body fat in adult women.

**Methods:** 484 patients who visited an outpatient clinic of family medicine in a university hospital in Seoul between 2004 and 2007 were recruited. 362 adult women were finally included after excluding patients with chronic systemic diseases and those taking medication that affect body weight were excluded. Family history of obesity, past medical history, physical exercise, and sleeping hours during weekdays and weekends were obtained through questionnaires. Height, weight, BMI, and body composition were measured using Bioelectric Impedance Analyzer.

**Results:** Subjects were divided into three groups according to sleep duration; less than 7 hours, 7~8 hours, and more than 8 hours. When obesity was defined as BMI( $\geq 25$ ), the group with more than 8 hours of sleep had an odd ratio of 2.21(95% CI 1.14-4.27) for obesity compared to the group with 7~8 hours of sleep after adjusting for covariates. When obesity was defined as percent body fat( $\geq 30\%$ ), the group with less than 7 hours of sleep had an odd ratio of 2.20(95% CI 1.01-4.80) for obesity compared to the group with 7~8 hours of sleep.

**Conclusion:** Our study revealed that inadequate amount of sleep was associated with significantly higher odds ratio for obesity based on both BMI and percent body fat.

## T2:PS:128

**Change in Arterial Stiffness among Metabolic Syndrome Patients after 10 Weeks of Aerobic Exercise**

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**Background:** Some research results indicated that arterial stiffness and pulse wave velocity were major risk factors of cardiovascular diseases and they increased among metabolic syndrome patients. This study investigated the effects of continued aerobic exercise on metabolic syndrome and arterial stiffness.

**Method:** The subjects were 10 middle-aged female metabolic syndrome patients who underwent medical check-up, met the criteria of NCEP-ATP III and had not taken exercise over the last 3 months. The exercise program was made up of 2 dance sports programs with the level of 50-80% of HRR (Heart Rate Reserve) that lasts 1 hour 2 times a week and walking a time with the level of 13 to 15 (slightly hard- hard) of RPE (Rate of Perceived Exertion) for 10 weeks. The level of arterial stiffness was measured by CAVI (Cardio Ankle Vascular Index) that used autonomic waveform analyzer. CAVI, anthropometry and blood sampling were conducted before and after the exercise program.

**Results:** CAVI that reflects the level of arterial stiffness significantly declined from  $7.5 \pm 1.0$ m/s to  $7.2 \pm 0.7$ m/s after the exercise program ( $P = 0.037$ ). Waist circumference significantly decreased from  $91.2 \pm 6.9$  cm to  $87.8 \pm 5.4$  cm ( $P = 0.008$ ), systolic blood pressure from  $126.1 \pm 12.5$ mmHg to  $121.6 \pm 10.4$ mmHg ( $P = 0.037$ ), fasting blood sugar from  $102 \pm 18.9$ mg/dL to  $90.2 \pm 16.3$ mg/dL ( $P = 0.005$ ), and triglyceride from  $184.5 \pm 65.7$ mg/dL to  $152.2 \pm 67.5$ mg/dL ( $P = 0.047$ ). After the exercise program, 6 subjects with 4 risk factors of metabolic syndrome and 4 subjects with less than 4 factors decreased to 2 subjects and 2 subjects, respectively.

**Conclusion:** Aerobic exercise significantly induced improvement of arterial stiffness and clinical indices among metabolic syndrome patients.

**T2:PS:129****Results six years after treatment of teenagers with severe obesity in specialized obese teenagers unit**Doyard PA<sup>1</sup>, Fille A<sup>2</sup>, Cheung Hing K<sup>1</sup> et Lambicchi S<sup>1</sup><sup>1</sup> Hôpital San Salvador, Hyères, France; <sup>2</sup> Faculté de Pharmacie, Marseille, France

108 obese patients stayed from one to 10 months (average 5 months) in the unit for treatment of obese teenagers in San Salvador Hospital from September, 1999 to October, 2000. 82 (75.9%) of these teenagers were girls aged from 12 years and 2 months to 15 years and 11 months (mean age 15 years and 7 months) whose Z-score ranged from 2.29 to 5 (average BMI 35.47). 26 (24.1%) of these teenagers were boys aged from 12 years and 4 months to 17 years and 6 months (mean age 15 years and 3 months) whose Z-score ranged from 2.5 to 4.72 (average BMI 33.45). These teenagers benefited from a treatment associating theoretical and practical dietary therapeutic education and rehabilitation with physical activity. Six years after the end of their stay we phoned the patients, 87 of them (that is 80.6%) among which 64 girls (78%) and 23 boys (88%) were contacted. The answers were validated by writings by nearly half of them. The results (expressed in BMI, as ages higher than 18 years at the moment of the results) are the following:

BMI	Girls		Boys	
	n	%	n	%
Less than 25	6	9.3 %	0	0 %
from 25 to 29.9	20	31.3 %	8	34.8 %
from 30 to 34.9	16	25 %	9	39.1 %
from 35 to 39.9	8	12.5 %	4	17.4 %
More than 40 (or bariatric surgery)	14 (7)	21.9 %	2 (1)	8.7 %
Total	64	100 %	23	100 %

After 6 years:

- 34 (39.1%) are not obese any more (IMC less than 30),
- 25 (28.7%) have a moderated obesity,
- 28 (32.2%) have a severe or massive obesity,
- 8 (9.2%) had recourse to a bariatric surgery.

The results of the treatment are better (40.6% non obese) and worse (34.4% of serious obesities) concerning girls compared to boys. The recourse to the bariatric surgery is also more frequent (11%) concerning girls. It is necessary to enrich the cohort to specify the results according to the duration of the stays, the age, the sex and the severity of the beginning obesity.

Taking into account the cost of the treatments in specialized environment, the indications of these stays, reserved for the teenagers having severe obesities, must be refined and discussed. In the same way, the indications of the bariatric surgery must be discussed, including in teenagers.

**T2:PS:131****Current criteria for Night Eating Syndrome (NES) exclude some aspects of night eating behaviour.**Cleator J<sup>1</sup>, Wilding J<sup>1</sup>, James M<sup>1</sup>, Sutton C.J.<sup>2</sup>, Judd P.A.<sup>2</sup>University of Liverpool Diabetes & Endocrinology Clinical Research Group<sup>1</sup>, Lancashire School of Health and PG Medicine, University of Central Lancs, Preston<sup>2</sup>.

**Introduction:** Investigation into NES is hindered by changing diagnostic criteria. In 2003 Stunkard characterised NES as: morning anorexia, eating  $\geq 50\%$  of calories after the last evening meal, waking to eat, consuming high calorie snacks during awakenings, symptoms for 3 months and exclusion of other eating disorders.

**Patients and methods:** 80 subjects from a UK obesity clinic ( $BMI \geq 40 \text{ kg/m}^2$ ) suspected of night eating were interviewed for evidence of NES based on the 2003 criteria. The interview included the Eating Disorder Examination to exclude other eating disorders (ED) and questions used by Stunkard's team to identify NES.

**Results:** Only 7 subjects met all 6 criteria. A further 12 met 5 criteria, 5 met 4 criteria and 6 met 3 criteria. Of those partially matching the criteria ( $n=23$ ), only 8 (35%) met the requirement to eat more than 50% of calories after the last evening meal. Fifteen (65%) reported snacking during night-time awakenings but individuals who ate very late and then went to bed and slept and individuals who wake to eat, but sleep in the day and stay awake at night are excluded using the criteria. Ten subjects had other ED or sub-threshold symptoms of ED. Overlap was noted between diagnostic groups. Five subjects meeting all or some of the NES criteria also had some symptoms of other ED. Forty subjects had no disordered eating.

**Conclusion:** The 2003 criteria appear too restrictive and are excluding significant numbers of individuals, whose disordered eating and sleeping patterns may be impacting on their obesity.

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**T2:PS:130****Efficacy of orlistat in treatment obese adolescents with menstrual disorders.**

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The aim of our study was to investigate the efficacy of orlistat on body weight, metabolism and ovulation restored in obesity adolescents with menstrual disorders. A total 32 adolescent aged 14-18 years with a mean body mass index BMI  $33.4 \pm 4.3 \text{ kg/m}^2$  were examined. Twenty four (75%) adolescents had oligomenorrhea, 5 (15.6%) had amenorrhea and another 3 (9.4%) suffered from dysfunctional uterine bleeding. All patients measurements of body composition, glucose and insulin response to oral glucose tolerance test (OGTT), fasting lipids and leptin, hormonal profile before and 6 month treatment with orlistat 360 mg/day as an adjunct to the hypocaloric diet and exercises. Of the 32 patients, 5 dropped out within the 1<sup>st</sup> month of the trial due to side-effects attributable to orlistat. After therapy remaining 27 adolescents showed weight loss averaged  $8.13 \pm 1.53 \text{ kg}$ , i.e. 8.74% of initials data. BMI was decreased by 8.69%. Insulin sensitivity, measured during OGTT, improved significantly ( $p=0.002$ ). Significant decrease total cholesterol from  $5.6 \pm 0.64$  to  $4.43 \pm 0.64 \text{ mmol/l}$  ( $p<0.001$ ); triglyceride from  $1.64 \pm 0.38$  to  $1.01 \pm 0.46 \text{ mmol/l}$  ( $p<0.001$ ); LDL from  $3.79 \pm 0.53$  to  $2.43 \pm 0.33 \text{ mmol/l}$  ( $p<0.001$ ) and HLD level significant increased from  $1.14 \pm 0.26$  to  $1.53 \pm 0.10 \text{ mmol/l}$  ( $p<0.001$ ). In hormonal profile significant decrease concentration of testosterone from  $2.9 \pm 0.87$  to  $2.15 \pm 0.55 \text{ nmol/l}$  ( $p<0.001$ ), androstenedione from  $14.28 \pm 4.39$  to  $9.54 \pm 2.57 \text{ nmol/l}$  ( $p<0.001$ ) and leptin from  $51.57 \pm 13.21$  to  $37.3 \pm 8.33 \text{ ng/ml}$  ( $p<0.001$ ) were observed. Also significant increased concentration of sex-steroid globulin binding from  $22.27 \pm 8.22 \text{ nmol/l}$  to  $28.3 \pm 7.65$  ( $p=0.007$ ). Free androgen index was decrease from  $14.65 \pm 7.37$  to  $8.49 \pm 4.38$  ( $p<0.001$ ) too. At the end of the 6 months, menstrual function was improved in majority of adolescent (81.5%). Spontaneous ovulation it was observed at 37% patients. Conclusion: the weight-loss therapy with orlistat is effective and should be considered as a first option for obese adolescents with menstrual abnormality. However, gastrointestinal side-effects limit its usefulness.

**T2:PS:132****Effects of Age and Obesity on 24-hour Heart Rate Variability in Healthy Lean and Obese, Young and Older Men**Tsofliou, F<sup>1</sup>, Jackson, D.M<sup>1</sup>, Fyfe C.L<sup>1</sup>, Sneddon, A.A<sup>2</sup>, Wahle, K.W.J<sup>3</sup>, Williams, L.M<sup>1</sup><sup>1</sup>Obesity and Metabolic Health Division, and <sup>2</sup>Vascular Health Division, Rowett Research Institute, Aberdeen, AB21 9SB, United Kingdom<sup>3</sup>School of Life Sciences, The Robert Gordon University, Aberdeen, AB25 1HG, United Kingdom

Heart rate variability (HRV) is used to assess cardiac autonomic function. HRV decreases and the incidence of obesity increases with ageing but any interaction between obesity and age on long-term HRV is unclear. The present study aimed to investigate the effects of ageing and obesity on 24-h heart rate variability in healthy lean and obese, young and older men.

A Holter recorder was used to determine 24-h HRV in 14 lean ( $BMI (23.6 \pm 1.5 \text{ kg.m}^2)$ ) and 13 obese ( $BMI (32.5 \pm 1.8 \text{ kg.m}^2)$ ) young men (20-37 yrs); and 22 lean ( $BMI (23.6 \pm 1.4 \text{ kg.m}^2)$ ) and 16 obese ( $BMI (31.7 \pm 1.6 \text{ kg.m}^2)$ ) older men (50-65 yrs). All time domain variables (SDNN, SDANN, SDNN index, rMSSD and pNN50) were measured.

Age significantly influenced all time-domain variables of HRV ( $P \leq 0.01$ ). For most of the time domain variables of HRV (SDNN, SDANN, rMSSD and pNN50) there was a significant interaction between age and BMI ( $P \leq 0.036$ ). For all time domain variables, young lean men had significantly higher 24-h HRV compared to young obese men and older men ( $P < 0.05$ ). SDNN index, but not the other time domain variables, was significantly higher in young obese men compared to older obese men ( $P < 0.05$ ). No significant differences were found in 24-h HRV between lean and obese older men.

In conclusion, while age significantly influenced 24-h HRV, the significant effect of BMI on HRV occurred only at the younger age and not in the older age group studied.

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## T2:PS:133

**Improvement of glycemic control and plasma lipids with a specific diet on metabolic syndrome patients**Radulian G<sup>1,2</sup>, Rusu E.<sup>1,2</sup>, A. Dragomir A<sup>2</sup><sup>1</sup> Nutrition, "Carol Davila" Medicine University, Bucharest, Romania<sup>2</sup> "N. Paulescu" National Institute of Diabetes, Nutrition and Metabolic Diseases, Bucharest, Romania

The diagnosis of metabolic syndrome can be established when 3 or more from 5 risk determinants (waist circumference, blood pressure, HDL-cholesterol, triglycerides and fasting glucose) are reported.

**Materials and Methods:** A number of 68 patients – 29 male (42,35%) and 39 female (57, 65%), with an average age 47,6 ± 8,6 years, obese (BMI>30kg/m<sup>2</sup>), with hypercholesterolemia (total cholesterol >200mg/dl, HDL- cholesterol<40mg/dl), type 2 diabetes mellitus, and hypertension – were included into an educational program consisting of diet and exercises.

The lifestyle changes of these patients aimed to a decreasing cardiovascular risk.

The educational program included a description of the risk factors and their primary prevention, a distinct diet (with decreased calory, lipid and sodium intake) and moderate intensity exercises (at least 3 days/week, for a minimum of 30 minutes). Every patient included in this program was clinically reevaluated each 2 months. Measurements of blood pressure, glycemia and lipid levels were taken after 6 months.

**Results**

Parameters	Baseline	6 months
BMI (kg/m <sup>2</sup> )	29,2 ± 4,4	26,1 ± 4,3
Total cholesterol (mg/dl)	223 ± 33	185 ± 24
HDL-chole (mg/dl)	34 ± 12	40 ± 18
TG (mg/dl)	163 ± 67	129 ± 54
FPG (mg/dl)	129 ± 24	118 ± 18
BP systolic (mm Hg)	150 ± 25	135 ± 15
BP diastolic (mm Hg)	100 ± 15	85 ± 10

**Conclusions:** The results further emphasize the need for education regarding weight loss and the management of associated risk factors, together with inadequate diets, alcohol consumption, sedentary life, smoking and stress.

## T2:PS:135

**Comparison of Abdominal Fat Measurement by DXA and Anthropometry**

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Waist circumference measured by a tape measure is a commonly used indicator of abdominal fat mass. Dual-energy X-ray absorptiometry (DXA), permits direct, immediate measurement of fat mass in the total body, and now also in a new abdominal region. The software automatically calculates %fat and fat mass. Several studies have shown a good relationship between DXA measurements and waist circumference (WC) in overweight individuals. We evaluated if these relationships were similar in underweight, normal weight, overweight, and obese patients.

A total of 403 subjects participated in this study. Weight status was defined using the World Health Organization BMI categories. One hundred and eighty eight subjects had a normal BMI for age (range 3.0 to 83 years), 68 were overweight (age range 6.0-59.5years), 117 were obese (range 5.0 to 79.6 years), and 44 were underweight (3.8 to 53.6 years). Abdominal fat (AF) mass between the ribs and pelvis was measured with a Lunar Prodigy (GE Healthcare), software version 8.1, which automatically calculates %fat and fat mass (g).

The linear regression model showed a significant correlation in normal subjects, overweight and obese patients, but were more significant in overweight and obese patients than normal subjects

BMI Category	Underweight	Normal	Overweight	Obese
Correlation of WC and AF	R2: 0.222 p=0.006	R2: 0.476 p< 0.001	R2:0.750 p< 0.001	R2: 0.668 P<0.001

In conclusion waist circumference measurements have a strong correlation with fat mass measured by DXA in overweight and obese individuals, and moderate or insignificant correlation in normal and underweight individuals, respectively.

## T2:PS:134

**Visceral adiposity is associated with impairment of quality of life independent of bmi**Han, JH<sup>1</sup>, Kim, SM<sup>2</sup>, Park, HS<sup>3</sup><sup>1</sup>Eulji University School of Medicine, Seoul, Korea<sup>2</sup>College of Medicine, Korea University, Seoul, Korea<sup>3</sup>University of Ulsan College of Medicine, Seoul, Korea

**Background:** Obesity and central obesity are associated with a loss in health-related quality of life (QOL). We estimated the relationship between visceral adiposity and QOL.

**Methods:** The study subjects were 123 men and 196 women (17-69 year-old) who had undergone health examinations for obesity treatment. Anthropometry was measured and visceral adipose tissue (VAT) area was determined by computed tomography. The subjects completed a set of standardized tests of Korean obesity-related QOL questionnaire.

**Results:** Mean QOL and subscales were associated with VAT in both men and women. Obesity-related QOL was more impaired in women and older (>=40 year-old) men for those in the highest VAT tertile as compared with those in the lowest VAT tertile.

After the multiple regression analyses with adjustment for age and BMI, VAT was identified as predictors of general KOQOL, physical health, work or routine lifestyle subscale in men and physical health and work subscale in women

In multiple logistic regression analyses, VAT was an independent predictor of QOL impairment even after adjustment of age and BMI in men and women.

**Conclusion:** VAT was associated with impairment of obesity-related QOL independent of BMI.

## T2:PS:136

**Validation of resting energy expenditure predictive equations with indirect calorimetry in obese adolescents**Hofsteenge GH<sup>1</sup>, Stam M<sup>1</sup>, Chin A Paw MJM<sup>2</sup>, Delemarre-van de Waal HA<sup>3</sup>, Weijs PJM<sup>1</sup>

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**Background:** When resting energy expenditure (REE) of obese adolescents cannot be measured by indirect calorimetry, it has to be predicted with an equation. The aim was to validate the published REE predictive equations with indirect calorimetry in obese adolescents.

**Methods:** Predictive equations were included when based on weight, height, gender, age, fat free mass (FFM) and fat mass, measured with dual energy x-ray absorptiometry. REE was measured with indirect calorimetry. Accuracy of equations was evaluated by the root mean squared prediction error (RMSPE), the mean percentage difference between predicted and measured methods (bias), the percentage of patients predicted within 10% of REE measured.

**Results:** Included were 42 predictive equations (of which 16 based on FFM) and 85 subjects (F 49, M 36) with mean age 14.6 (range 12-18) y and BMI 33.3 (range 24.0-44.5) kg/m<sup>2</sup>. The RMSPE ranged 171-659 kcal per day and the percentage of patients with acceptable prediction ranged from 76% to 1% depending on the equation used. The gender specific Molnar equation (1994) had the smallest RMSPE (171 kcal/d) and bias (-1 kcal/d), with high percentage (72%) of subjects predicted well. The Schofield equation had a high RMSPE and bias, and a low percentage of boys predicted well.

**Conclusions:** Indirect calorimetry remains the method of choice for REE. However, when REE predictive equations are used for obese adolescents 12-18 years, the Molnar equation appears most accurate.

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## T2:PS:137

**Association of certain socioeconomic and personal factors with weight status in high school adolescent girls in semnan, iran**

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**Introduction:** The objective of this article was to association of certain socioeconomic and personal factors with weight status in high school adolescent girls in Semnan.

**Materials and methods:** In a cross-sectional study, using two stage random sampling, 256 girl students aged 14-18 year old were randomly selected from 8 Semnan high schools. Weight and height were measured and BMI was calculated. Nutritional status was defined by index of BMI-for-age from CDC 2000 reference. Data on demographic and nutritional attitude were collected by questionnaires.

**Results:** Data analyzed indicated that age at menarche, mother literacy, nutritional attitude had significant relationship with nutritional status (respectively  $P = 0.031$ ,  $P = 0.001$ ,  $P < 0.0001$ ). Student age, family size, father literacy, parental occupation and economic status had no significant relationship with nutritional status.

**Conclusion:** Nutrition education to increase nutritional attitude in students and nutritional knowledge level of mothers are necessary to induce.

**Key words:** adolescent, BMI, nutritional status, socioeconomic, menarche, nutritional attitude

## T2:PS:139

**Long-term weight reduction following a 20 week lifestyle intervention program**

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**Background:** Obesity and associated comorbidities have developed in epidemic dimensions worldwide. Lifestyle-improving interventions are indicated for conventional, presurgical, and postsurgical treatments. In this prospective uncontrolled study, the long-term effect of a 20 week multifactorial group intervention on weight reduction was investigated with a total follow-up of 3 years.

**Methods:** 48 women (median, range, 52, 22-69 years, BMI 31.3, 22.1-54.5 kg/m<sup>2</sup>) and 33 men (55, 24-69 years, 31.5, 26.0-44.6 kg/m<sup>2</sup>) completed the intervention. The intervention consisted of a 1.5 hour group meeting once a week for 20 weeks, including recommendations on diet, daily physical activity, eating habits, and stress management. 68.8% of the women and 81.8% of the men were enrolled in the 1, 2, and 3 year follow-up.

**Results:** The weight difference in women after 20 weeks was (median, range) -6.2% (-22.4/-1.6), 1 year -5.8% (-25.0/+2.9), 2 years -7.0% (-32.9/+10.0), and 3 years -7.5% (-27.1/+11.4). In men, the difference after 20 weeks was -6.3% (-22.6/0.0), 1 year -5.3% (-20.4/+8.5), 2 years -4.6% (-15.9/+3.2), and 3 years -5.0% (-15.0/+7.1) with  $p > 0.05$ . After 1 year, 87.9% of the women and 92.6% of the men showed reduced body weight, after 2 years 87.9% and 74.1%, and after 3 years 81.8% and 77.8%, respectively.

**Conclusions:** 80% of the patients maintained a weight reduction of 5-8% of their initial weight throughout 3 years following a 20 week multifactorial lifestyle-improving group intervention. The multifactorial approach presents a more optimistic outlook than monofactorial strategies. Interventions of longer duration are likely to yield improved long-term success rates.

## T2:PS:138

**Low carbohydrate diet improves liver function in nondiabetic obese patients**

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**Objectives:** Although weight loss has been shown to reduce steatosis in nonalcoholic fatty liver disease (NAFLD), the impact of dietary macronutrient composition is unknown. The aim of our study was to examine the changes in hypertransaminasemia after weight reduction in obese patients using a low carbohydrate hypocaloric diet.

**Research design and methods:** A total of 55 obese nondiabetics were treated with a hypocaloric diet (1200kcal) with a low carbohydrate composition (40% carbohydrate, 35%fat, 25%protein) for 3 months. Patients with normal serum alanine aminotransferase levels (ALT) were classified as group I (n=35), and those with elevated ALT were group II (n=20). The outcome variables were changes in AST, ALT, body fat percentage and body mass index (BMI) in these patients.

**Results:** In group I, BMI (29.76+/-5.22 vs 26.60+/-5.09 kg/m<sup>2</sup>,  $p < 0.05$ ) and body fat percentage (34.93+/-3.96 vs. 31.19+/-4.70 %,  $p < 0.05$ ) decreased. In group II, BMI (31.50+/-5.52 vs 28.21+/-5.14 kg/m<sup>2</sup>,  $p < 0.05$ ) and body fat percentage (35.57+/-5.85 vs 31.57+/-5.70 %,  $p < 0.05$ ) decreased. Liver function also improved in both groups (ALT: group I 18.77+/-6.66U/L vs. 16.31+/-5.05U/L,  $p < 0.05$  and group II 65.00+/-27.17U/L vs. 38.7+/-20.51U/L,  $p < 0.05$ ; aspartate aminotransferase activity (AST): group I 20.71+/-12.16U/L vs. 17.20+/-4.36U/L:  $p < 0.05$  and group II 37.50+/-12.90U/L vs. 25.15+/-9.69U/L:  $p < 0.05$ )

**Conclusions:** We showed that weight reduction using a hypocaloric diet with low carbohydrate composition was associated with improvement in liver function in non-diabetic obese patients.

## T2:PS:140

**Normal-weight obese syndrome: body composition, eating behavior and psychosocial issues**

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Normal weight obese women (NWO) are characterized by early inflammation related to excess body fat mass and this could be a significant prognostic indicator of the risk of developing obesity-related diseases (De Lorenzo A et al, Am J Clin Nutr 2007).

The aim of the present study was to verify body composition, psychosocial issues, eating behavior and physical activity of NWO women.

23 healthy non-obese (BMI < 25 kg/m<sup>2</sup> and Fat % < 30%), 42 NWO (BMI < 25kg/m<sup>2</sup> and Fat % > 30%) and 123 preobese (BMI = 25-30 kg/m<sup>2</sup> and Fat % > 30%) women without metabolic syndrome were studied. Anthropometrical variables, body composition and fat distribution evaluated by DXA, cardiovascular (CVD) risk factors, basal metabolic rate by indirect calorimetry, assessment of physical activity, presence of depression, binge eating and yo-yo phenomenon were evaluated and compared between groups. Mean age was the same in all groups.

Total and abdominal fat but not body weight or CVD risk factors were significantly different between healthy non-obese and NWO women. Compared with healthy non-obese women, NWO women presented significantly more frequently depression, binge-eating, yo-yo phenomenon and had lower physical activity levels.

NWO women, a group of women at risk, can be misclassified if body fat and fat distribution are not evaluated. NWO women are vulnerable because, except of the signs of early inflammation related to the excess body fat, they seem to be less active, frequently depressed and present more frequently binge eating and greater oscillations of their body weight.

## T2:PS:141

**Evaluation of early weight loss measures as predictors for successful treatment with orlistat 60 mg**Bacon, TH<sup>1</sup>, Schwartz, SM<sup>2</sup>, Selmani, A<sup>2</sup>, Bansal-Dev, VP<sup>2</sup><sup>1</sup> GlaxoSmithKline Consumer Healthcare, Weybridge, UK<sup>2</sup> GlaxoSmithKline Consumer Healthcare, Parsippany, NJ, US

Regulatory guidance on the design of studies evaluating weight loss medications differs with respect to requiring a dietary lead-in. Weight loss during the first 12 weeks of treatment with orlistat 120 mg has previously been shown to be a good indicator of long-term weight loss, whereas loss of  $\geq 2.5$  kg during a 4 week lead-in adds little predictive benefit [1]. A similar analysis was conducted for orlistat 60 mg by pooling data from two randomised, double-blind, placebo-controlled trials. After a 4 week lead-in with a hypocaloric, low-fat diet, subjects (BMI 28–43 kg/m<sup>2</sup>) were randomised to treatment. Data presented are for subjects who completed 1 year of treatment.

For subjects who lost  $\geq 3\%$  baseline weight after 12 weeks of treatment, mean relative weight loss at 6 months was 8.1% (n=200) compared with 1.3% (n=114) in subjects who lost  $< 3\%$  (p<0.0001). Findings were similar at 1 year. Loss of  $\geq 5\%$  weight at 12 weeks was also closely associated with long-term weight loss. Conversely, lead-in weight loss ( $\geq 2.5$  kg or  $< 2.5$  kg) provided lower predictive value for relative weight loss at 6 months in those who lost  $\geq 3\%$  (8.8%; 6.8%) or  $< 3\%$  (1.1%; 1.3%) at 12 weeks (p=0.0083). No relationship was observed between weight loss during the lead-in and at 1 year (p=0.4120), nor did it have a significant effect on weight loss at 6 months or 1 year in subjects who lost  $\geq 5\%$  weight at 12 weeks.

Weight loss achieved after 12 weeks treatment with orlistat 60 mg is an accurate predictor of successful weight loss at 6 and 12 months. Lead-in weight loss provides little additional value.

1. Rissanen A *et al.* *Int J Obes Relat Metab Disord* 2003; 27: 103-9

## T2:PS:143

**The particulars of mutual nutritional and psychological initial session of clients with eating disorders**Esaulov, V<sup>1</sup>, Ionova, L<sup>2</sup>, Timoshenko, E<sup>3</sup>, Studenikina, M<sup>1</sup><sup>1</sup> Medical Center "Dr. Ionova's clinic", Moscow, Russia

On the 1<sup>st</sup> session of clients with eating disorders (ED) there must be a mutual consultation of both dietician and psychologist. It helps to design effective individual program of nutritional and psychological treatment.

Every specialist has his own specific number of tasks. Dietitian clarifies the client request, obtains the history, appoints the examination, forms the primary diagnosis, clears up individual food strategies which let the doctor determined the level of ED. The obtained information determines the further approach of the treatment, gives a possibility to offer an individual nutrition program, to prescribe the individual diet, which meet the client's requirement, taking into consideration his somatic state.

The psychologist focuses on defining the primary psychological profile, motivation level, actual psychological problems and inner personal resources. The level of cooperation, optimal number of sessions and planned level of psychological assistance are evaluated. Clients' detailed informing by the psychologist and dietician helps to choose an optimal and the most comfortable and convenient program. This results in contracting the treatment program. The contracting helps to motivate doubting and unconscious clients and select out unmotivated people.

The creation of comfortable and confidential climate by psychologist and dietician gives the positive direction of treatment and brings to successful results. Cooperation of the specialists, the opportunities of mutual assistance are of prior importance.

Mutual initial session provides faster and more objective helps to define approximate period and initial plan of treatment. This allows the therapy to obtain the results more effectively.

## T2:PS:142

**Osteomalacie as a long term complication of malabsorptive bariatric surgery**

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**Rationale:** Last years obesity is treated more frequently with bariatric malabsorptive surgery. However the long term safety and complications of these procedures are not well known. I describe here seven female patients who underwent about seven years ago a bariatric surgery procedure for treatment of obesity, now presenting with severe osteomalacia and bone loss.

**Methods:** Out of the ambulatory endocrinology clinic, I describe seven patients suffering from severe bone pain and –fractures.

All these patients have characteristics of osteomalacia and in the past a bariatric procedure. All patients underwent clinical examination, fasting blood sample for calcium, alkaline phosphatase, vitamin D and PTH.

**Results:** Mean age of the patients is 39  $\pm$  6 years Duration of operation is 9.2  $\pm$  3 years Mean loss of weight is 27  $\pm$  3 kg Mean BMI is 27.3  $\pm$  4.2 kg/m<sup>2</sup> All patients had hypocalcaemia with a mean value of 7.9  $\pm$  0.4 mg/dl normal 8.6-10.2 mg/dl Mean vitamin D-status is 9.7  $\pm$  1.8 mg/dl normal 7.1-45 mg/dl All patients had an elevation of PTH 173  $\pm$  22 mg/dl normal 9-78 mg/dl Alkaline phosphatase : 277 U/l  $\pm$  37 normal 240 U/l

**Conclusion:** In this case report I present seven post-bariatric surgery patients with severe osteomalacia with hypocalcaemia, vitamin D-deficiency and secondary hyperparathyroidism. All patients had severe bone pain and vertebral fractures. The osteomalacia in these patients is caused by malabsorptive bariatric surgery and can be considered as a long term complication of this procedure. The treatment of these patients is difficult and consists of oral and intravenous administration of calcium and vitamin D. Further larger studies are needed to examine the frequency of this severe long term complication and when planning this surgical procedure, the surgeon must evaluate and communicate to his patient this possible severe complication.

## T2:PS:144

**Predictors of weight loss**

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Body Impedentiometric Analysis (BIA) is easy, non-invasive, relatively inexpensive and can be performed in almost any subject. Recently some data suggest that anthropometric indices used as indirect measures of total or visceral fat mass could be correlated with some of the parameters of the BIA. More recently a new anthropometric index, the ratio between height (m) at cube and waist (cm) at cube ( $H^3/W^3$ ) has been proposed.

Aim of this study was to evaluate whether parameters obtained with BIA can be used as predictors of qualitative weight loss in obese patients undergoing non-pharmacological treatment. Free Fat Mass (FFM) is correlated with  $H^3$  and therefore we evaluated possible relations among  $H^3/W^3$  and BIA parameters.

An observational cohort study was performed on a consecutive series of 142 obese. The follow up was of 3.6, 12 months. The parameters measured were: weight loss, waist, BMI, blood pressure, FFM, Fat Mass (FM), Total Body Water (TBW), Muscle Mass (MM). The analysis was performed by intention to treat, with a weight loss  $> 5\%$  of initial body weight defined as a therapeutic success. A multivariate analysis, after adjustment for age and sex, showed that  $H^3/W^3$  correlates in a different way on the basis of the follow up: in the short term it is negatively correlated with the weight loss; in the long term this parameter is significantly correlated with FFM and inversely with FM.  $H^3/W^3$  could be an easy to use anthropometric index useful in monitoring obese patients following a weight loss program based on lifestyle intervention.

## T2:PS:145

## Dietary habits and physical activity in greek adolescents

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**Background and Aim:** Childhood obesity is evolving into an epidemic in many regions of the world but the exact roles of its contributory factors remain elusive. Our aim was to record dietary habits and physical activity in adolescents in a rural region.

**Methods:** The study included 668 students [14.26±0.33 years old, Body Mass Index (BMI): 22.04±0.20 Kg/m<sup>2</sup>] attending randomly selected schools. The students were subjected to anthropometric measurements and were asked to fill in a questionnaire regarding dietary behavior and physical activity. A diet score was developed taking into account the weekly consumption of meat, legumes, fruits, vegetables, full fat dairy products and snacks. In particular, we assigned ratings from 1 to 3 for each food group with higher scores indicating consumption closer to the Mediterranean pattern.

**Results:** Overall prevalence of overweight and obesity was 24.6% and 10.5% respectively. Mean diet score did not differ between normal BMI and overweight/obese students (9.43±0.11 vs. 9.67±0.14 respectively, p=0.07). However normal BMI students reported higher level of physical activity compared to overweight/obese (1.27±0.03 vs. 1.06±0.04 hours/day respectively, p<0.001). Boys also, spent more time in physical activity in comparison with girls (1.40±0.04 vs. 1.01±0.03 hours/day respectively, p<0.001).

**Conclusion:** A high prevalence of obesity was recorded in our population. Physical activity was higher in boys and in students with normal BMI. In contrast, dietary habits did not correlate with BMI, fact which could reflect dieting or knowledge of favorable choices or even underreporting in obese individuals.

## T2:PS:147

## A validated screening tool can be used to identify night-eaters in a UK obesity clinic.

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**Introduction:** Identifying Night Eating Syndrome (NES) in the clinical setting is problematic. Limited resources prevent routine interviews by eating disorder specialists. Screening tools may be useful for preliminary identification, although there is no tool validated for use in UK obese populations.

**Materials and Methods:** 80 subjects from a UK obesity clinic were interviewed for evidence of NES and other eating disorders (ED) based on current criteria. Subjects also completed a screening tool based on the interview items. Results of the interview and tool were compared.

**Results:** The seven subjects who met all criteria for NES and 23 who partially met the criteria were classed as one 'night-eater' group (n=30). All other subjects were classed as non 'night-eaters' (n=50). ROC curve analysis showed an optimal cut-off score of 23 or higher on the night eating items of the tool and demonstrated good sensitivity (0.93, 95%CI 0.78, 0.99) and specificity (0.78, 95%CI 0.64, 0.89) for identifying night eating. Screening items for ED were less successful, with high levels of sensitivity, but low specificity. (For binge eating: sensitivity, 1.0, 95%CI 0.66, 1, specificity 0.14 95%CI 0.07, 0.24; for bulimia: sensitivity 1.0 95%CI 0.59, 1, specificity 0.10 95%CI 0.04, 0.19.) Night eating items showed good internal consistency (Cronbach's alpha 0.75).

**Conclusion:** The tool was successful in identifying night eating, but did not exclude other ED, a prerequisite for a NES diagnosis. In clinical practice, those identified as night-eaters by the tool should have a follow-up diagnostic interview to determine if another Eating Disorder is present.

Research related to this abstract has been funded by Roche Products Ltd

## T2:PS:146

## Relation between television viewing and obesity risk factors in children

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**Background and aim:** Sedentary activities are considered to be essential in increasing the risk of childhood obesity. The aim of this study was to examine whether children's television viewing may be a useful indicator of obesity risk factors such as poor dieting or low level of physical activity.

**Methods:** 485 children aged 6-13 years old, from elementary schools of Nemea region were included in the study. Body Mass Index (BMI) was calculated, while information about the time spent on television watching and organized physical activities, as well as about dietary habits was collected.

**Results:** Children who watched television for >2hours(h)/day were significantly more likely than children who watched television for < or = 2h/days to: have more than 2 servings/week of fast food (77.4% vs. 63.2% respectively, p<0.05), and to have fewer than 2 servings/week of vegetables (35.2% vs. 20.4% respectively, p<0.05). These children were also less likely to participate in organized physical activities (19.3% vs. 29.9% in children who watched television for < or = 2h/days, p<0.05). Finally children who watched television for >2h/day tended to have higher BMI than children who watched television for < or = 2h/days, although this difference did not reach the level of statistical significance (prevalence of overweight/obesity respectively: 33.6% vs. 29.9%, p=NS).

**Conclusion:** Children watching television for more than 2 hours daily are at increased risk of having adverse habits such as low levels of physical activity and poor dietary behavior.

## T2:PS:148

## BMI, waist circumference and lipid peroxidation in a group of schoolchildren from the Community of Madrid. Differences according to the sex.

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BMI and waist circumference are predictors of higher oxidative stress in adults. However, data on the association of abdominal fat and oxidative stress in children are scarce.

**Objective:** Study the relationship between Malondialdehyde (MDA) levels and the BMI and waist circumference in schoolchildren.

**Material and Methods:** The study subjects were 352 schoolchildren (154 male and 198 female) from the Community of Madrid, between 9 and 12 years of age. Weight, height and waist circumference were measured following WHO norms. MDA levels were determined as oxidative stress indicators. BMI and a Z-score for waist circumference (Z-WC) were calculated for each children.

**Results:** There were no differences between boys and girls regarding age, weight, height, BMI, Z-WC or MDA. Waist circumference were significantly lower in girls (63.5±7.25 cm versus 66.6±9.8 cm in boys; p<0.001). BMI and WC were correlated with MDA levels (r=0.6406 and r=0.5773, respectively, p>0.001). When considering sex, BMI and Z-WC, only BMI are a predictor of MDA in boys (MDA=0.327 + 0.029 IMC + 0.001 Z-WC; R<sup>2</sup>=0.5188, p<0.001 for the whole model), while both BMI and Z-WC are positive predictors of MDA in girls (MDA= 0.550 + 0.018 BMI + 0.030 Z-WC; R<sup>2</sup>=0.3484, p<0.001 for the whole model).

**Conclusion:** BMI is a strong predictor of MDA levels in both boys and girls, while higher Z-WC is also an independent predictor only in girls. Abdominal obesity could be a risk factor for higher oxidative stress since childhood, especially in girls.

**Funding:** This work was supported by a grant of the Fondo de Investigaciones Sanitarias de la Seguridad Social (FISs) (Spain) (Ref. PI060318).

## T2:PS:149

**Novel Healthy Weight loss Method –Sai Style Chinese Qigong Meridian Therapy**Sai, Sh<sup>1,2,3</sup>, Sai Y<sup>1,2,3</sup>, Sai S<sup>1,2,3</sup><sup>1</sup>Japan Chinese Medical Qigong Diet Association; <sup>2</sup>Kyuido International Diet Academy; <sup>3</sup>Kyuido Chinese Medical Qigong Meridian Facility

Although obesity is closely associated with diabetes and cardiovascular diseases, there is still no definitive method for healthy weight-loss in a short term. We have developed a novel anti-obesity method according to the Traditional Chinese Medicine which named Sai-Style Chinese Qigong Meridian Therapy (SQT). SQT can enhance the life energy *qi* through whole body acupressure (Dianxue), and make the *qi* circulate the entire body smoothly and consequently results in healthy weight-loss. Here, we try to report 68 Japanese female cases of effective weight-loss by SQT from June 2004 to September 2005. SQT was performed 25 min at a time, 3~5 times a week. The average age and height were 36.55 years and 158.35 cm, respectively. The average body weight, body fat percentage, and body mass index (BMI) were reduced from 62.18 kg, 32.43%, and 24.80 kg/m<sup>2</sup> to 56.77 kg, 27.78 % and 22.64 kg/m<sup>2</sup> respectively after 20 sessions of SQT within 1 month, and were further decreased to 51.62 kg, 24.52% and 20.59 kg/m<sup>2</sup> after 40 sessions of SQT within 2 months. SQT also succeeded in controlling food intake at minimum levels without feeling hungry. Symptoms such as constipation, irregular menstrual cycling, menstrual pain, humpback, swelling, and cold hands or feet also reduced markedly or disappeared after SQT. In conclusion, SQT is a novel and very effective method to treat overweight and obesity. We are planning to explore the molecular mechanisms of SQT and popularize this healthy therapy in Asia, America and Europe in the near future.

## T2:PS:151

**The effect of meal replacements high in glycomacropeptide on weight loss & markers of cardiovascular disease risk**

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Glycomacropeptide (GMP) is a peptide that has been shown to stimulate release of cholecystokinin which may promote satiety.

**Aim:** The aim of this 1-year study was to examine whether greater weight loss could be achieved and sustained with a GMP-enriched whey powder supplement compared to a skim milk powder supplement.

**Methods:** In a randomised, double blind, parallel design study using meal replacements, participants had weight, body composition (dual energy X-ray absorptiometry), blood pressure, fasting lipids, glucose and insulin measured at baseline, 6, and 12 months. Supplements contained 15g protein from GMP-enriched-whey-protein-isolate (T1), or skim-milk-powder (T2) and 900 kJ/sachet. Volunteers were advised to consume 2 sachets/day instead of 2 meals for 6 months and 1 sachet/day for a further 6 months. One hundred and twenty seven participants (34 men, 99 women, 95.5±15.4 kg, BMI 33.4±3.4 kg/m<sup>2</sup>, 50.0±12.4 yr) commenced, 82 completed 6 months and 72 completed 12 months of the study.

**Results:** At 6 months weight loss was -9.5±5.8 vs -11.0±6.0 kg, T1 and T2 respectively and -9.9±8.8 vs -10.8±7.4 kg T1 and T2 respectively at 12 months (P<0.001 compared with baseline, at both time-points) with no differences between treatments. Total and LDL-cholesterol, triacylglycerols, glucose and insulin, systolic and diastolic blood pressure decreased at 6 and 12 months (All P<0.01 compared with baseline with no difference between treatments). HDL-cholesterol was significantly increased at 12 months (P<0.001 compared with baseline).

**Conclusion:** Weight loss of 10kg was sustained after 12 months with improvements in cardiovascular disease risk markers. GMP had no additional effect.

**Funding:** Research relating to this abstract was funded by Murray Goulburn Nutritional, Victoria, Australia

## T2:PS:150

**Double-blind, randomized clinical trial of high protein and nutritionally balanced conventional partial meal replacement low-calorie diets for reduction in visceral obesity with Korean people with metabolic syndrome.**Lee, K<sup>1</sup>, Lee, J<sup>1</sup>, Bae, W<sup>2</sup>, Cho, B<sup>2</sup><sup>1</sup> Seoul National University Bundang Hospital, Seongnam, South Korea<sup>2</sup> Seoul National University Hospital, Seoul, South Korea<sup>3</sup> Wonkwang university Sanbon Hospital, Gunpo, South Korea

**Background:** Metabolic syndrome has reached epidemic proportions in Korea. Various partial meal replacement low-calorie diets (PMR-LCDs) plans are a popular option for Korean people with metabolic syndrome in the weight loss and maintenance program. The effectiveness of high protein PMR-LCDs (P-PMR-LCDs) and nutritionally balanced conventional PMR-LCDs (C-PMR-LCDs) on visceral obesity is, however, still unknown in Korean people with metabolic syndrome. We aimed to evaluate and compare the effectiveness of P-PMR-LCDs and C-PMR-LCDs on reduction in visceral obesity.

**Method:** Eighty obese adults with metabolic syndrome were double-blinded, randomized to either P-PMR-LCDs group and C-PMR-LCDs group. Visceral fat area was measured with computed tomography (CT) and total body fat mass was measured with dual energy X-ray absorptiometry (DEXA), each before and after the 12-week trial. Participants got diet meal plan at 1200 calorie a day for women and 1500 calorie a day for men from clinical dietitian and received a six session of dietary counseling every other week.

**Result:** Visceral fat area by CT was decreased in the amount of -23.1 ± 30.0cm<sup>2</sup> in P-PMR-LCDs group and -30.5 ± 30.2cm<sup>2</sup> in C-PMR-LCDs group (P value 0.248). Total fat mass by DEXA was also decreased in the amount of -2.5 ± 2.2kg in P-PMR-LCDs group and -2.3 ± 2.2kg in C-PMR-LCDs group (P value 0.770).

**Conclusion:** 12-week diet plan for obese patients with metabolic syndrome using both P-PMR-LCDs and C-PMR-LCDs were associated with significant and comparable weight loss and improvements on visceral obesity. But, no significant differences were observed between two groups in this study.

**Conflict of Interest:** Payment received from Herbalife for lecture on obesity treatment. (prof. Cho, B.)

**Funding:** Research relating to this abstract was funded by Herbalife Korea Co., Ltd.

## T2:PS:152

**Are overweight boys stronger than normal weight boys?**Fernández García, J<sup>1</sup>, Alvero Cruz, JR<sup>1</sup>, Barrera Expósito, J<sup>1</sup>, Carnero, EA<sup>2</sup>, Quiterio A<sup>2</sup>, Sardinha, LB<sup>2</sup><sup>1</sup> Sport Medicine School. Faculty of Medicine, University of Málaga, Spain.<sup>2</sup> Health and Exercise Laboratory. Faculty of Human Movement. Technical University Lisbon, Portugal.

An increase in regular physical activity (PA) behaviour, particularly vigorous PA, is important to prevent childhood obesity. Traditionally, children prefer an intermittent pattern of PA. In order to achieve a good performance in these types of exercise, great levels of explosive dynamic strength (EDS) are needed. **Objective:** The aim of this study was to compare EDS and (IS) isometric strength between normal (NB) and overweight boys (OB).

**Methods:** Seventy-five boys were recruited (14.8±1.9 yrs; BMI 22.9±4.4 kg.m<sup>-2</sup>; %FM 22.8±8.4%). Children were considered overweight based on the body mass index (BMI) age-specific cut-off points; skeletal muscle mass (SMM) and fat mass percent (%FM) was estimated by anthropometry; SMM index was calculated (kgSMM.m<sup>-2</sup>). To assess EDS, a countermovement jump (CMJ) was used. IS was assessed with a dynamometer for hands (ISH) and lower limbs (ISLL). PA behaviour was determined using questionnaires. Maturation was assessed by photographic models. Independent sample T-test was performed.

**Results:** NB were better on CMJ, 32±7vs26±5 cm and logSMM index, 1.22±0.1vs1.13±0.1 N.kgSMM<sup>-2</sup>, also log%FM was lower 1.24±0.1vs1.47±0.1 (p<0.001). OB had better performance on ISH 0.94±0.24vs0.72±0.20 N.kgSMM<sup>-1</sup>; and ISLL 2.06±0.60vs1.58±0.57 N.kgSMM<sup>-1</sup> (p<0.001). No significant differences were found in maturation and PA.

**Conclusions:** The main finding of this study was that OB presented a higher levels of IS, although their SMM index and CMJ were lower. These results suggest that an overload due to an excess of %FM should be a stimulus to increase IS, since habitual PA is performed with overload. More research is needed to fully understand this relationship.

## T2:PS:153

**Validation of fat free mass predictive equations based on bio-electrical impedance with dual-energy x-ray absorptiometry in obese adolescents**

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**Background:** Body composition of obese adolescents can be measured accurately by dual energy x-ray absorptiometry (DXA). Bio-impedance spectrometry (BIS) is a quick and easy tool for clinical practice, less expensive and without radiation. The aim was to validate published equations for the prediction of fat free mass (FFM) based on bio-electrical impedance, with DXA as reference in obese adolescents.

**Methods:** Predictive equations were included when based on weight, height, gender, age, impedance, resistance and/or reactance data. FFM was measured with bio-impedance spectroscopy and DXA. Accuracy of equations was evaluated by the root mean squared prediction error (RMSPE), the mean percentage difference between methods (bias), and the percentage of patients predicted within 5% of FFM measured by DXA.

**Results:** Included were 33 predictive equations and 85 (F 49, M 36) obese adolescents. Mean age 14.6 y, mean BMI 33.3 (range 24.0-44.5) kg/m<sup>2</sup>. The RMSPE ranged from 2.9-27.5 kg and the percentage of patients with acceptable prediction ranged from 75-0 % depending on the equation used. The DeLorenzo equation (FFM = 2.330 + 0.588 Height (cm)<sup>2</sup>/Resistance (Ohm) + 0.211 Weight (kg)) had almost lowest RMSPE (3.0 kg), smallest bias (-1 %) and the highest percentage (75 %) of subjects predicted well. This was consistent over gender, BMI and age groups.

**Conclusion:** When bio-impedance spectroscopy is used in obese adolescents 12-18 years of age, the most accurate predictive equation for fat free mass appears the DeLorenzo equation.

**Funding:** Vumc, Zonmw

## T2:PS:155

**Effect of High Protein Diet on Inflammatory Proteins in Obese Women**

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**Aim:** Obesity is independent risk factor for cardiovascular disease, which may be mediated by increased secretion of inflammatory proteins by adipose tissue. Widespread popularity of high protein diets, questioned the superiority of these diets in how best can achieve both weight loss and clinical benefit by these diets. We aimed to evaluate the effects of high protein diets on weight loss and cardiovascular disease risk including inflammatory proteins in obese women.

**Methods:** Twenty-eight (20-48 y) obese women (BMI: 30-41 kg/m<sup>2</sup>) were assigned to a high protein (HP: 30% of energy) or a standard protein (SP: 15% of energy) diet, for 10 weeks of weight loss dietary intervention.

**Results:** Weight loss (6.0 ± 2.3 kg with HP and 4.9 ± 2.4 kg with SP; P = 0.43) and fat loss (4.6 ± 2.1kg with HP and 3.9 ± 2.0 kg with SP; P = 0.63) did not significantly differ between groups. Insulin sensitivity index improved more by HP diet (P = 0.01). The reduction in serum triacylglycerol concentration was significant in both groups (HP; P = 0.005, SP; P = 0.03) without any diet effect. Total cholesterol, HDL-C and LDL-C did not change significantly. Plasma leptin decreased more (Diet effect; P<0.05) with HP (8.7 ± 8.8 pg/ml) rather than the SP diet (0.6 ± 6.4 pg/ml. No significant changes either in adiponectin, TNF-α, IL-6 or logCRP were observed after weight loss, although there was a trend of improvement in all inflammatory proteins.

**Conclusions:** High protein diet was more effective in lowering plasma leptin concentration and improving insulin sensitivity index than the standard protein diet. However, the magnitude of weight loss, improvement in serum lipids or plasma inflammatory proteins did not differ significantly between an energy-restricted high in protein or with standard protein content.

## T2:PS:154

**Effects of sibutramine and other therapies on erectile dysfunction in diabetic patients**

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As it knows the erectile dysfunction is a frequent complaint of the patients. Thru the multiple causes of erectile dysfunction, diabetes is very common, this one being more than twice frequent. The onset at relatively younger ages affects more deeply live quality and the couple relationships in these patients.

We evaluated 530 diabetic patients and other 520 patients with another pathology excepting diabetes mellitus in a period of 12 months. From the lot of diabetic patients 424 (80% ) described various degrees of erectile dysfunction. From the other lot – no diabetes only 195 (37.5% ) were diagnosed with erectile dysfunction. The treatment was chosen dependent of present of micro- or macro-vascular complications with: PDES inhibitors, substitution with testosterone, intracavernous injections, yohimbine, psychotherapy and vacuum devices.

In the patients presenting with obesity we divide in two groups depending of the therapy sibutramine (10-15 mg/day) and life style changing versus only life style changing. Comparing the results we evidences the best results in the group treated with PDES inhibitors, substitution with testosterone and sibutramine – 90% (20 treated in these group) in non diabetic group and 60% (30 treated) in the group of diabetic patients.

The results in the groups without sibutramine the results was 80% and 50%.

The weight change in the sibutramine treated group was 8.5% in non diabetic patients group and 6.3% in the diabetic patients group. We consider that sibutramine represent a helpful tool in the management not only of weight, even for erectile dysfunction in diabetic patients.

## T2:PS:156

**Effect of a 2 years multifactor approach on weight regain**

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**Background and Aims:** We have considered a multifactor approach to control weight regain after weight loss: diet, physical activity, cognitive-behavioral therapy, orlistat “on-off” treatment.

**Materials and Methods:** 50 patients (mean BMI 36.4 kg/m<sup>2</sup>) were enrolled after a mean weight loss of 17%. Patients came to the clinic every 2 months (first year) and every 3 months (year 2). Patients received diet and physical activity counseling and in case of a ≥ 2.5% weight regain: food questionnaire, cognitive-behavioral therapy, orlistat 120 mg tid. as long as weight regain was ≥ 2.5% (“on-off” treatment). In case of special occasions, orlistat was also prescribed at patient request.

**Results:** Baseline mean age was 43 ± 11 years, BMI 30.1 ± 5.7 kg/m<sup>2</sup>. 5 patients dropped out. After 2 years, no weight regain was observed: 80.7 kg ± 17.1 compared to 82.1 kg ± 15.6 at baseline. 58% of the patients had at least an additional weight loss or stable weight and 38% at least one episode of weight regain. Orlistat was prescribed in 48% for special occasions, in 34% for special occasions and continuous intake, in 8% for continuous intake and in 10% no intake. For the “weight loss” group, occasional orlistat intake was present in 83% of the patients and for the “weight regain” group in 68%.

In conclusion, this new multifactor approach with an “on-off” orlistat program appears to be promising. These results should be confirmed with the weight loss maintenance program at 4 years which is actually ongoing.

**Funding:** This study was funded by Roche Pharma (Schweiz) AG.

## T2:PS:157

**Adherence to Mediterranean diet in adult Greek obese population.**

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Obesity is a rapidly expanding epidemic in Western Societies, with rates of over 30% across Europe. A contributing factor is the modern lifestyle with reduced physical activity and removal from Mediterranean diet (MD). The aim of our study was to examine the adherence to MD of the Greek obese and overweight population and further investigation of their nutritional habits.

91 adult subjects (14 males, 77 females) with Body Mass Index (BMI)>25 Kg/m<sup>2</sup> completed the Food Frequency Questionnaire. The anthropometric measurements were taken and biochemical parameters were estimated. The mean BMI of the sample was 34.9 ± 6.2 kg/m<sup>2</sup> and the mean daily energy intake was 1570.2±555.2 Kcals. According to the nutrient intake we created 4 groups: high fat intake group (43.9%), high fat and protein intake (25.3%), high carbohydrate intake (14.3%) and the group that followed the MD (16.5%). MD group presented lower incidence of type 2 diabetes mellitus (DM2), arterial hypertension, dyslipidemia and low daily energy intake. High fat intake group has the greatest daily energy intake (1796.7±674.6 Kcal/d) and tend to lose more weight (5.7±4.4% loss of initial body weight) after low-caloric diet. High carbohydrate intake group presented greater incidence of DM2 (15.4%) and the lowest weight loss (2.9±2.7%) after energy intake reduction.

In conclusion, only 16.5% of the Greek obese subjects follow the MD while the nutritional habits of the rest 83.9% present a modulation of MD ingredients with increased amounts of fat, proteins and carbohydrates in different combinations.

## T2:PS:159

**Chocolate Eating and Reward-Dependence: a Multivariate Analysis on Polytoxic Addicts, Alcoholics, and Healthy Controls**

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**Background:** Food is a powerful reinforcer, and individual differences in the reinforcing value of food may help to explain the imbalance in food intake and addictive drug abuse.

**Objective:** To test (i) the chocolate eating behaviour, (ii) and reward-dependence in detoxified polytoxic addicts, alcoholics, and healthy controls.

**Design and Methods:** Subjects were asked to eat defined units of chocolate until a predefined threshold of aversion was reached, which was periodically measured on a visual analogue scale after each unit of eaten chocolate. Output variables were the area under the curve (AUC) of the amount of chocolate eaten over time (AUCA), the AUC of wanting of chocolate over time (AUCW), and AUCA/AUCW. Reward-dependence (RD, RD1: Sentimentality, RD2: Attachment, RD3: Dependence) was analysed by the Temperament and Character Inventory (TCI).

**Results:** 48 students were recruited by advertisement, 21 detoxified alcohol addicts and 23 clinically detoxified polytoxic addicts taking part in a long-term therapeutic community were included. Significant correlations have been found between AUCA and RD2 (r=0.30) and RD3 (r=0.36). Reward-dependence showed to be a relevant predictor of AUCA in all groups (β=0.45, p<0.01). All groups differed significantly (p<0.001) in AUCA, AUCW and AUCA/AUCW.

**Conclusion:** RD was linked to chocolate eating behaviour and the choice of drug. These findings have implications for addiction treatment and prediction of relapse giving more insight to the complexities of addictive eating behaviour and sensitivity to natural reward.

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## T2:PS:158

**Young obese subjects are resistant to the antilipolytic effect of insulin during exercise**

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The aim of the study was to investigate whether 1) the antilipolytic action of insulin in adipose tissue is present during exercise 2) obese subjects are – similarly to resting conditions - resistant to this action of insulin.

6 lean (BMI 23.6±0.4 kg/m<sup>2</sup>, age 25.5±0.4 yr) and 6 obese (BMI 31.4±1.3 kg/m<sup>2</sup>, age 28.3±1.8 yr) subjects performed a 45 min aerobic exercise (intensity at 50% of VO<sub>2</sub> max) on two occasions: 1) during a constant insulin/glucose infusion keeping the insulin and blood glucose levels stable during the exercise 2) in control conditions (saline infusion). Exercise-induced lipolysis in subcutaneous adipose tissue was assessed using microdialysis and glycerol concentrations were measured in two microdialysis probes: one being perfused with Ringer solution and the other with phentolamine (alpha adrenergic antagonist).

In control conditions the exercise-induced lipolysis in subcutaneous adipose tissue was lower in obese than in lean subjects and it was potentiated by phentolamine only in obese. During insulin infusion, the exercise-induced lipolysis was reduced in lean subjects by 67% and 71% in control and phentolamine probe, respectively, and only by 39% and 26% in obese. The exercise-induced responses of catecholamines were similar in both conditions in lean as well as in obese subjects.

Results suggest that the antilipolytic effect of insulin in adipose tissue is present during the exercise and that the obese subjects are, when compared to lean, resistant to this action of insulin. This resistance may be one of the elements of the reduced flexibility of metabolic responses in obese individuals.

## T2:PS:160

**Successful Weight Maintenance and Body Composition: a 6 to 30 Months Follow-up**

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**Background:** Maintenance of weight loss is a core problem in the treatment of obesity. Structured Weight control programs can improve maintenance and body composition in obesity.

**Objective:** To assess long-term effects of body weight and body composition during a standardized obesity program emphasising on fat loss

**Design and Methods:** Obese patients (n=508) were recruited in a primary care setting and followed a standardized obesity program using meal replacements (AENGUS<sup>®</sup>, Austria). Body composition was evaluated by both conventional and vector bioelectrical impedance analysis (RxC Graph). Patients having completed up to 6, 12, 18, 24, 30, or more than 30 months of the treatment program (groups I-VI) were analysed, the results were compared to their baseline data.

**Results:** We observed significant weight loss in all groups (% body weight compared to baseline: I: 88.5±5.5, II: 88.5±5.7, III: 88.9±7.6, IV: 91.2±6.6, V: 88.9±8.0, VI: 92.9±8.5; p<0.001). The assessed program showed a marked reduction in body fat (% body fat compared to baseline I: 76.6±12.3, II: 77.1±11.6, III: 79.6±14.6, IV: 83.8±11.7, V: 79.2±16.2, VI: 87.3±18.5; p<0.001). Body cell mass was reduced in all groups within a range of 4 to 6% compared to baseline (p<0.001).

**Conclusions:** These results confirm the importance of accurate monitoring of body composition in obesity programs and the impact on individual interpretation of successful long-term treatment.

**T2:PS:161****The influence of weight-reducing therapy with orlistat on intrajejunal lipolytic activity and orocecal transit time of solid meal**

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**Introduction:** The aim of the study was to assess the influence of eight-week weight reduction therapy with use of orlistat on lipolytic activity and orocecal transit time of solid meal.

**Patients and methods:** 40 obese women without concomitant diseases were enrolled into the study and randomly assigned to the eight-week weight-reducing treatment with use of orlistat (age  $28.2 \pm 6.3$  y, BMI  $37.7 \pm 7.4$  kg/m<sup>2</sup>) or placebo (age  $28.8 \pm 7.2$  y, BMI  $36.6 \pm 5.6$  kg/m<sup>2</sup>). All the subjects received weight-reducing program. <sup>13</sup>C-MTG breath test was used to assess intrajejunal lipolytic activity. Orocecal transit time was assessed with hydrogen test meal

**Results:** Weight reduction was  $9.1 \pm 4.1$  kg ( $9.0 \pm 3.2$  %) and  $5.8 \pm 3.2$  kg ( $5.9 \pm 3.2$  %) in placebo group.

	Orlistat group n = 20		Placebo group n = 20	
	Before treatment	After treatment	Before treatment	After treatment
AUC	30,3 ±	5.7 ±	26.5 ±	23.1 ±
cumulative 6-hour <sup>13</sup> C recovery	9.9	4.5**	6.8	9.0**
D <sub>max</sub> maximum momentary <sup>13</sup> C recovery	9.0 ± 2.0	2.16 ± 1.2**	8.7 ± 1.5	7.9 ± 3.3 <sup>#</sup>
T <sub>max</sub> time at which D <sub>max</sub> (min)	288.0 ± 57.9	180.0 ± 77.3**	262.5 ± 79.6	246.0 ± 75.8**
OCTT (min)	208.4 ± 53.6	270.9 ± 63.5**	215.6 ± 75.9	234.1 ± 71.6 <sup>#</sup>

\*\* p<0,001 – before vs after treatment

<sup>#</sup> p < 0,05; \*\* p < 0,001 for the comparison between the orlistat vs placebo group

**Conclusion:** Orlistat inhibiting intrajejunal lipolytic activity delays orocecal transit time.

**T2:PS:163****Effect of Dietary Regime on Serum Phospholipids Fatty Acid Profile in Hypertensive, Hyperlipidemic, Overweight Patients**

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It is well established that serum phospholipid fatty acid (FA) profile is susceptible to nutritional, but also to metabolic and pharmacological modifications. Our preliminary reports showed that hyperlipidemia alters phospholipid (PL) FA profile. This study was designed to examine effects of dietary regime on serum PL profile in hypertensive, hyperlipidemic, overweight patients with and without diazepam treatment.

17 of 35 overweight, hyperlipidemic patients (total cholesterol > 5.2 mmol/l and < 7.8 mmol/l, BMI > 25 < 30 kg/m<sup>2</sup>) receiving antihypertensive were administered 4-10 mg/day of diazepam. Patients followed AHA-Step 1 dietary treatment (reduced saturated FA and cholesterol intake, increased fruit, vegetable and dietary fiber intake). Patients' dietary regime was analysed using NUTPLAN, a software with wide applications among which are recipe calculation and diet planning harmonised with EuroFIR recommendations. Serum PL fraction was isolated by one-dimensional thin layer chromatography. PL FA composition was determined using gas chromatography.

At the beginning, diazepam treated, overweight, hypertensive patients had significantly higher total cholesterol, saturated FA and lower n-6 and n-3 FA. After 12 weeks dietary regime, total cholesterol, total SFA decreased and n-6 and n-3 FA increased in overweight hypertensive patients with higher levels of SFA in diazepam group.

Based on our results we conclude that serum PL FA are direct biochemical indicators reflecting dietary polyunsaturated FA. Percentage of serum SFA in diazepam treated patients reflects not only dietary SFA intake but also endogenous SFA synthesis. Our results indicate importance of PL FA profile for prevention of atherosclerosis in hypertensive patients.

*This work was completed on behalf of the EuroFIR Consortium (FOOD-CT-2005-513944)*

**T2:PS:162****Ingestion of Guaramaté (a mixed herbal extract of guarana and maté) stimulates thermogenesis in humans**

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Guarana and maté are commercially-available as herbal-derived substances that are advocated for weight-loss. The amounts of caffeine in these products are below those known to increase metabolic rate, and the amounts of catechin-polyphenols are well below those found to interact with caffeine for thermogenic stimulation. However, maté also contains caffeoylquinic-polyphenols that might interact synergistically with caffeine and catechins (contained primarily in guarana) to promote thermogenesis. In this study we investigated whether a mixed extract of guarana and maté (Guaramaté) stimulates thermogenesis without having a significant effect on cardiovascular regulation.

In a double-blinded cross-over study, 10 healthy volunteers ingested capsules containing placebo or Guaramaté. Each dose of Guaramaté contained caffeine (47-75 mg), catechins (12-27 mg) and caffeoylquinic derivatives (63-111 mg). Energy expenditure and respiratory quotient were assessed continuously by ventilated hood indirect calorimetry, while heart rate and blood pressure were measured continuously using a Task Force Monitor.

Ingesting the Guaramaté capsules, but not the placebo, after an overnight fast led to significant increases in resting energy expenditure over a 2h period (+ 4%, P<0.05). Furthermore, Guaramaté significantly enhanced the thermogenic response to a mixed meal by about 30% over a 3-h period (P<0.01). No significant differences in respiratory quotient, heart rate and blood pressure were found between Guaramaté or placebo treatment - whether under conditions of basal metabolism or postprandial metabolism.

These studies indicate that this Guaramaté product, which has no significant impact on acute cardiovascular responses, may contribute to weight control through its stimulatory effects on thermogenesis and energy expenditure.

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**T2:PS:164****Benefits of Orlistat beyond the weight loss**

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**Introduction:** Orlistat in addition to produce a weight loss and a reduction of total corporal fat as a result of a fat absorption reduction in the diet, presents other antiatherogenic characteristics: the prevention of the Diabetes Mellitus (DM) and the Metabolic Syndrome (MS), reduction of the visceral fat and the values of the adipose tissue (AT), besides to improve the lipid profile and the classic and no classic cardiovascular risks.

**Methods:** The studies published with orlistat as XENDOS, X-PERT, XXL, Derosa et al., Golay et al., Sari et al., Swinburn et al., Samuelson et al., Dimitrov et al., Filippatos et al., Cocco et al., Didangelos et al., Brandberg et al., Tikkanen et al., Bellido and cols., Richelsen et al. and Zelber-Sagi et al. were selected for this study.

**Results:** Orlistat added to life style changes produced a reduction of 37% of the development of DM-2. In patients with DM-2 was observed a reduction of the HbA1c.

The reduction of the waist perimeter and the visceral fat estimated have been confirmed in all the studies. The weight loss was enough to reduce the AT.

Regarding the lipids, stood out the reduction of the postprandial hyperlipidaemias and the decrease of total and LDL cholesterol. A decrease of non classic risk factors was also observed.

**Conclusions:** Orlistat represent a good choice for the treatment of obese patients due to an effect over different components of the MS including the decrease of the waist perimeter and the visceral AT.

## T2:PS:165

**Gastric banding improves short- and long-term glycaemic control in T2DM patients**

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**Background:** Diabetes and obesity are intimately linked diseases. Whether the linking factor is insulin resistance or hypersecretion, obese subject are thrice more likely to develop T2DM than lean subjects, irrespective of other factors. The risk also increases with increasing BMI. Therefore reducing the demands on islet cells by reducing the contact between food and foregut and weight reduction should be beneficial in treating and, indeed, curing T2DM. All types of bariatric procedures showed beneficial effect on glycaemic control, with gastric banding (GB) leading to a normalisation in oGTT in more than 50% of subjects.

**Method:** 409 patients (291 undergoing GB, 118 undergoing another elective procedure) with a sufficient remaining insulin secretion have been investigated repeatedly within 48 hours after the operation and at 6 months after.

	GB	Controls
No. of patients	291	118
Out of which T2DM	110 (37.8%)	10 (8.5%)
Mean age (years)	52.6	51.1
Mean BMI (kg.m <sup>-2</sup> )	45.9	42.8
Mean fasting glucose (mmol/l)	8.9	7.2

**Results:** The fasting plasma glucose decreased significantly within 24 hours of operation, due to restricted oral intake. However, this trend has been maintained even when ingestion of pureed food has been initiated. The results at 6-month follow up are not available in time for abstract submission but will be amended before the time of the congress.

**Conclusion:** Short-term improvement in glycaemia after GB is in agreement with data published recently by Pories et al, Buchwald et al. and others and this trend is fully expected to continue until and beyond the 6-month investigation.

## T2:PS:167

**How much weight loss is needed to improve each component of metabolic syndrome?**Katsukawa, F<sup>1</sup>, Shimojima, K<sup>1</sup>, Sakaki, S<sup>1</sup>, Azuma, K<sup>1</sup>, Oguma, Y<sup>1</sup>, Kinoshita, N<sup>1</sup>, Ishida, H<sup>1</sup>, Onishi, S<sup>1</sup>, Yamazaki, H<sup>1</sup><sup>1</sup>Sports Medicine Research Center, Keio University, Yokohama, Japan

**Introduction:** Modest weight loss has beneficial effects on overall metabolic profiles in subjects with metabolic syndrome (MS). However, the impacts of weight loss on each MS component may vary and greater amount of weight loss may be needed when improvements in specific metabolic targets are intended.

**Methods:** Ninety-nine obese subjects (18-39 y/o, 66M/33F, BMI: 34.1±6.0) were evaluated for body composition and metabolic profiles before and after 1.5 years of weight reduction program entailing diet and physical activity. Moving average of each 25 subjects across the entire range of % weight change (-0.2% to -31.2%) and respective % change in metabolic parameters were used to assess the association between weight loss and improvement in metabolic variables.

**Results:** The mean % weight change ranged from -3.2% to -21.5%, and all the metabolic parameters improved as the moving average of % weight loss became greater. However, the degree of improvement differed among variables; visceral fat area, blood pressure and glucose area during glucose tolerance test showed statistically significant improvement (-12.1%, -3.2% and -5.4%, respectively) even for the 25 subjects who lost the least weight (i.e. -3.2%). HOMA-R and insulin area showed significant reduction only for those who lost >7% of the initial weight, and log TG and HDL-C showed significant improvement only for those who lost >12%.

**Conclusion:** These data suggest that the level of weight loss needed to improve each metabolic parameter differs, and the target level of weight loss for each MS subject must be individualized, considering their metabolic abnormalities.

## T2:PS:166

**Which obese patients do improve with a therapeutic education diet in patient rehabilitation unit ?**

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Since 1991, our unit welcomes every year about one thousand obese and/or type 2 diabetics patients for a nutritional rehabilitation based on theoretical and practical workshops animated by various professionals (doctors, nurses, dieticians, physiotherapists, psychologist).

In order to guarantee an optimal care of obese patients, we tried to identify relevant medical criteria to determine the necessity of an hospitalisation in patient care.

We also listed all the characteristics of the patients during the first half of 2006 and compared them with the weight loss and with the evolution of the educational knowledge of the patients.

This audit allowed to establish a list of criteria for no admittance for which the education does not seem to bring any supplementary profit. These criteria existed in 2 % of the patients welcomed during the considered period. Among these criteria, we found a body mass index lower than 27 kg/m<sup>2</sup> without associated comorbidity (as mellitus diabetes), the existence of psychotic confusion or untreated psychiatric pathology, the absence of personal motivation, and more than 3 stays in the unit.

We suggest to take in account these criteria to know whether obese patients could improve with a therapeutic education in diet rehabilitation unit.

## T2:PS:168

**Examination of fatty acid intake in overweight, obese and morbidly obese persons**Halmy E<sup>1</sup>, Kovacs G<sup>2</sup>, Karoly J<sup>2</sup>, Halmy L<sup>2</sup><sup>1</sup> Hungarian Association for Overweight and Obese, <sup>2</sup> IRM Central Hospital, Budapest

**Aim:** Examination of energy and fatty acid intake by BMI and gender in adult obese persons.

**Material:** n: 269, overweight n:59, 21.9%, obese n:112, 41.6%, morbidly obese n:98, 36.4%.

**Method:** 3-day nutritional interview with Nutricomp software

**Results:** Mean energy intake was 0:2278 kcal/day(SD:807), men0:2696 kcal/day, women0:2061 kcal/day. The energy intake by BMI groups revealed significant difference only between the morbidly obese and the groups of lower BMI: overweight0:2176 kcal/day (SD:615), obese0:2093 kcal/day (SD:769), morbidly obese0:2550 kcal/day (SD:881).

The ratio of macronutrients was: fat 38.76 energy%(SD:7.13), carbohydrate 45.28 en%(SD:7.03), protein 16.13 en%(SD:2.95). Total fat intake was the highest in the age group of 30-44y, 0:129.33 g/day(SD:64.81). The intake of SFA, MUFA and PUFA was significantly (p<0.0001) higher in men. Total fat intake by BMI groups was: overweight: 0:88.97(SD:30.43), obese:0:90.41(SD:38.56), morbidly obese0:124.56 (SD:44.75), SFA intake: overweight0:26.29 (SD:9.69), obese0:27.12 (SD:13.68), morbidly obese0:32.87 (SD:15.12), MUFA intake: overweight 0:26.68(SD:10.5), obese0:27.69(SD:14.54), morbidly obese 0:34.83(SD:15.25), PUFA intake: overweight 0:22.21(SD:8.49), obese 0:22.03(SD:0.79), morbidly obese 0: 27.07(SD:10.84). All the three values were significantly (p<0.001) higher in the morbidly obese group. The ratio of n-6/n-3 intake by BMI groups was: overweight0:27.4(SD:12.0), obese 0:25.8(SD:11.1) morbidly obese0:28.1 (SD:11.5) (n.s.), and the highest values were found in the age group above 60: 31.8/1 (norm: 4/1).

**Conclusion:** Similar fatty acid intake was found in overweight and obese persons, and extremely high intake in the morbidly obese. Attention should be paid to the fatty acid intake of overweight and morbidly obese patients. The risk of sudden cardiac death of the latter is 40 times higher.

## T2:PS:169

**Comparison of the nutritional habits of students aged 7-15 between urban and rural regions of northern Greece**

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2<sup>nd</sup> Dept. of Pediatrics, Aristotle University of Thessaloniki, AHEPA General Hospital, Thessaloniki, Greece.**Introduction:** The purpose of our study was to compare the eating patterns of students aged 7-15 between urban (Prefecture of Thessaloniki) and rural areas (Prefecture of Chalkidiki) of Northern Greece.**Students and Methods:** A specific questionnaire was distributed to 2702 students from urban areas (**Group A**) and to 1386 students from rural (**Group B**), aged 7-15 to be completed by their parents. We received valid answers from 2216 (82%) students of **Group A** (1076 boys and 1140 girls) and from 1170 (84.4%) of **Group B** (550 boys and 620 girls).**Results:**

Eating habits	Boys			Girls		
	Group A (n=1076)	Group B (n=550)	p	Group A (n=1140)	Group B (n=620)	p
Two main meals	4,6%	8,5%	<0,01	3,5%	7,7%	<0,001
Three main meals	95,4%	91,5%	<0,01	96,5%	92,3%	<0,001
One secondary meal	49,3%	33,5%	<0,001	33,9%	39,5%	<0,05
Two secondary meals	43,9%	59,1%	<0,001	58,9%	56,8%	ns
Red meat	92%	90,4%	ns	88,4%	87,1%	ns
White meat	95,6%	92,4%	<0,01	91,9%	89,8%	ns
Fish	86,2%	89,5%	ns	88,2%	94,2%	<0,0001
Bread, pasta and rice	97,6%	90,9%	<0,001	98%	95,3%	<0,01
Dairy products	98,1%	95,1%	<0,001	97,8%	97,1%	ns
Eggs	80,7%	86,7%	<0,01	85,9%	86,8%	ns
Salads and vegetables	52,3%	52,4%	ns	56,2%	64%	<0,01
Delicatessen	74,1%	67,1%	<0,01	75,4%	70,3%	<0,05
Juices	90,4%	95,6%	<0,001	94,6%	93,8%	ns

**Conclusion:** Children in urban areas consume two main meals, fish and eggs at a lower percentage than those in rural areas, whereas three main meals, bread, pasta, rice and delicatessen at a higher percentage.

## T2:PS:171

**Peanut effects on appetite, leptin, insulin and ghrelin levels in normal weight volunteers**Bressan, J<sup>1</sup>, Coelho, S B<sup>1</sup>, Costa, N M B<sup>1</sup>, Alfenas, R C G<sup>1</sup>, Mattes, RD<sup>2</sup><sup>1</sup> Universidade Federal de Viçosa, Viçosa, MG, Brazil<sup>2</sup> Purdue University, West Lafayette, IN, USA

The aim was to evaluate the effects of peanuts on appetite and appetitive hormone concentrations when served as part of a meal or as a snack.

Sixty participants were divided randomly into 3 treatment groups (PG: peanut, MG: mix and PMG: peanut + mix). Each participant completed 4 sessions (1 control meal, 1 control snack, 1 treatment meal and 1 treatment snack). Appetite, anthropometric indices, body composition, physical activity and dietary intake were monitored during the sessions. Plasma leptin, ghrelin and insulin analyses were conducted on a 30 volunteer subsample.

Individuals felt hungrier when peanuts were added to a meal of sandwich + banana + chocolate (control) compared to an isocaloric amount of the same meal without peanuts. The same held for the addition of the MG which was matched to the peanuts on volume, energy and macronutrient distribution. This result may be due to smaller gastric volume associated with the PG and MG loads compared to control. Participants also reported a stronger desire to consume something sweet on days the PG and MG were consumed. The control meal also led to a more rapid meal termination. No significant differences were observed in hormone concentrations.

In this study, the addition of peanuts or a mix with similar volume, energy content and macronutrients distribution did not augment satiety or appetitive hormone responses relative to isoenergetic meals without these loads.

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## T2:PS:170

**Lh/fsh ratio and fasting and postprandial metabolic parameters in patient with polycystic ovary syndrome**Leszczyńska-Gołabek I<sup>1</sup>, Malczewska-Malec M<sup>1</sup>, Gołabek D<sup>2</sup>, Kieć-Klimczak M<sup>1</sup>, Kwaśniak M<sup>1</sup>.<sup>1</sup> Department of Clinical Biochemistry Collegium Medicum of Jagiellonian

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<sup>2</sup> Department of Obstetric and Perinatology Collegium Medicum of Jagiellonian University Cracow.<sup>3</sup> Department of Endocrinology Collegium Medicum of Jagiellonian University Cracow**Objective:** Polycystic ovary syndrome is the most common endocrinopathy in women. Insulin resistance is a common feature of PCOs and is more marked in obese woman. Gonadotropins concentration and LH/FSH ration is obligatory test to diagnose patients with PCOs.**The aim of our study:** was to compare correlation between LH/FSH ratio and fasting and postprandial metabolic parameters: (glucose concentration, insulin concentration, HOMA-IR, lipids concentration) in patients with PCOs and without this endocrinopathy**Material and Methods:** 25 patients with PCOs (Study group) and 10 healthy volunteers (BMI 18-25 kg/m<sup>2</sup>) (Control group) was included into the study. Total cholesterol, triglycerides, HDL, LDL were measured. During OGTT (75g glucose) at 0, 60 120 minutes, glucose and insulin concentration were controlled.**Results:** Fasting and postprandial glucose and insulin concentration were significantly higher in patients with PCOs compared to control group. Obese (BMI >30 kg/m<sup>2</sup>) patients with PCOS were characterized by higher fasting and postprandial glucose and insulin level compared to patient with PCOs and normal weight (BMI 18-25 kg/m<sup>2</sup>).

Patients with PCOs and very high LH/FSH ratio demonstrated the highest level of metabolic parameters. LH/FSH ratio correlated with glucose and insulin concentration and insulin resistance.

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## T2:PS:172

**Reduction of weight using Sibutramin**

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<sup>a</sup> Faculty of Military Health Science, Hradec Kralove, Czech Republic<sup>b</sup> Faculty of Electrical Engineering CTU Prague, Czech Republic**Introduction:** The prevalence and incidence of obesity increase during the last 10 year in whole world. In Czech Republic more than 25% inhabitants are obese. Obesity is a risk factor leading to many serious civilization diseases. Complex access using pharmacotherapy is real good way to lose weight.**Methods:** In 212 obese men and 28 obese women with BMI over 30 kg/m<sup>2</sup> and with failure of lipid metabolism the reduction of body mass was carried out. The whole pharmacotherapy was 4 months. The changes of selected anthropometric (weight, BMI, % of fat, WHR) and biochemical (TAG, GLY, TCHOL, HDL, LDL) parameters were monitored.**Goal:** Monitor of effect of taking a dose of 10mg of sibutramin a day. By patients meet inclusion criteria.**Results and conclusion:** After a 4-month pharmacotherapy reduction we noticed that average decrease of weight was 6,8 kg, of BMI 2,0 kg/m<sup>2</sup>. In both group (men also women) was found statistically significant decrease of body fat. The decrease of whist was 5,2 cm in group of men and 6,6 cm in group of women. The positive effect therapy of decrease of level TCHOL, GLY, TAG was noted too. The level of HDL was not changed.

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## T2:PS:173

**Evaluation of factors involved in the lipid mobilization during exercise in human using a somatostatin analog infusion (octreotide).**

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We evaluated, in man, the relative role of various factors involved in the lipid mobilization during exercise like insulin, adrenergic system, Atrial Natriuretic Peptide (ANP) and growth hormone (GH).

Eight lean young men matched for age and physical fitness performed a 60 min exercise bouts at 50% of their maximal oxygen consumption one day under placebo infusion and another day under octreotide infusion. Lipolysis in subcutaneous adipose tissue (SCAT) was evaluated using local microdialysis with selected antagonists: phentolamine (alpha-AR antagonist), propranolol (beta-AR antagonist) and aminoprylline (PDE inhibitor).

Octreotide infusion at rest decreased plasma insulin which remained low during exercise. Octreotide suppressed the exercise-induced increase of plasma epinephrine and GH. In both conditions, norepinephrine and ANP increased similarly during exercise. The increase of plasma glycerol concentrations during exercise was largely majored under Octreotide. In the microdialysis Ringer probe, the exercise-increased dialysate glycerol concentrations (DGC) were higher under octreotide than placebo. In the phentolamine and propranolol probe, the higher DGC under octreotide than placebo revealed the contribution of insulin during exercise. The lack of difference in DGC between phentolamine probe and phentolamine plus propranolol probe under octreotide suggest the absence of norepinephrine involvement. But under placebo, DGC were lower in phentolamine plus propranolol probe than in phentolamine probe, showing the beta-adrenergic action of epinephrine. In aminoprylline probe, the DGC were strongly enhanced in both conditions at rest, and the lack of difference in exercise-increased DGC between placebo and octreotide conditions argues for a possible ANP contribution.

## T2:PS:175

**The Efficacy and Safety of Herbal Mesotherapy on Fat Mobilization**

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**Backgrounds:** Mesotherapy is widely used for aesthetic management of localized fat or cellulite in developed countries without sufficient evidence. This study was performed to verify the efficacy and safety of ephedra and green tea mesotherapy on fat mobilization.

**Methods:** Twenty-five otherwise healthy 20-35 year-aged overweight women (body mass index  $\geq 23\text{kg/m}^2$ ) were recruited and randomly assigned to two groups: experimental (ephedra and green tea mesotherapy) group (n=13), placebo (saline) group (n=12). Total 8 times of herbal mesotherapies were performed once a week, the previous 4 times were performed on right thigh (1st period), after wash-out of 1 week, the latter 4 times were performed on left thigh (2nd period) without any modification of diet or exercise. Body composition, thigh circumference were measured at each period before and after. Subcutaneous fat was measured by CT scan at the 1st period before and after and free fatty acid (FFA) was measured immediately before 1st treatment, 1 hour later, 24 hours later, and 7 days later. Subjective satisfaction score and adverse events were also evaluated.

**Results:** In the subcutaneous fat, there were no significance between groups, but in the circumference, experimental group had significant change when compared with placebo group (p<0.05). In serum FFA, experimental group has significant elevation in 1 hour after the 1st treatment (p<0.05). There were no serious adverse events in both groups.

**Conclusions:** Herbal mesotherapy with ephedra and green tea may have possibility of size-reduction effect on localized fat through regional lipolytic action.

**Key words:** mesotherapy, localized fat, ephedra, green tea

**Acknowledgement:** This research was funded by The Society of Korean Medicine for Obesity Research.

## T2:PS:174

**The effect of the arg16 allele of the beta (2)-adrenergic receptor polymorphism in the reponse to EGCG intake on obese women after weight loss.**

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The most abundant catechin of green tea, epigallocatechin gallate (EGCG), could have some health benefits on obesity treatment. The presence of Arg16Gly polymorphism in ADRB2 gene has been related to insulin resistance.

The aim of the present study was to explore the effect of EGCG in the insulin resistance of obese women with Arg16 allele in ADRB2 gene after a hypocaloric diet treatment.

38 healthy obese women (BMI>30 kg/m<sup>2</sup>) followed a balanced hypocaloric diet (REE, Vmax, x 1.3 – 600kcal/day) during 12 weeks. They were divided into 4 groups according to genotype (RT-PCR real time), Arg carriers (Arg-Gly + Arg-Arg) and Gly-Gly group, and treatment (EGCG, 99% TEAVIGO, or placebo, 300 mg/day). BMI, body composition (DEXA) and blood insulin and glucose (ELISA) were assessed before and after treatment and HOMA-IR was calculated.

There were not statistically significant differences in weight (P=0.960) and fat mass loss (P=0.890) between the groups. There was a significant interaction effect (P=0.013) of genotype in the response to the EGCG treatment on the HOMA-IR change adjusted with weight loss. Arg16 women were more insulin resistant than Gly-Gly group after weight loss without EGCG (P<0.05). The improvement of insulin sensitivity in Arg16 carriers was higher after EGCG treatment (P<0.05).

In conclusion, EGCG, as energy restriction program helper, improves insulin sensitivity in women carriers of Arg allele in the ADRB2 gene.

## T2:PS:176

**Effect of lifestyle changes in childhood obesity – changes in paraoxonase activity and adipokine levels**

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**Objective:** Childhood obesity shows an increasing tendency in the developed countries meaning a predisposing factor to the later cardiovascular morbidity and mortality in adulthood. We investigated the effects of lifestyle changes on three adipokines – leptin, adiponectin, TNF- $\alpha$  level – and on the activity of PON1 because of their main role in the process of atherosclerosis.

**Patients and methods:** 23 obese, non-diabetic children (age: 11.45 $\pm$ 1.82 years) took part in a two-week long program consisting hypocaloric diet and regular physical activity. Levels of adipokines - leptin, adiponectin, TNF- $\alpha$  – and paraoxonase and arylesterase activity of PON1 were measured before and after the intervention.

**Results:** Two-week long diet and physical activity resulted in the significant decrease of the anthropometric data (BMI: 29.13 $\pm$ 5.05 vs. 27.79 $\pm$ 4.9 kg/m<sup>2</sup> p<0.0001; body fat percentage (BFP): 41.3 $\pm$ 6.37 vs 40.0 $\pm$ 6.86% p<0.001), in leptin (55.02 $\pm$ 33.42 vs. 25.76 $\pm$ 19.94 ng/ml p<0.0001) and significant increase in adiponectin levels (7.53 $\pm$ 3.26 vs. 8.79 $\pm$ 3.44  $\mu$ g/ml p<0.05) and PON1 paraoxonase activity (107.19 $\pm$ 72.87 vs. 121.75 $\pm$ 93.48 U/l p<0.05). We found significant correlation between leptin and adiponectin (r=-0.402 p<0.05); TNF- $\alpha$  (r=0.321 p<0.05).

**Conclusion:** Our data suggest that short-term lifestyle changes resulting in weight-loss influence the metabolic state to an antiatherogenic direction in obese children regarding the changes in leptin, adiponectin levels and PON1 paraoxonase activity. This draws attention to the importance of physical activity and appropriate nutrition in childhood.

**Keywords:** leptin, adiponectin, PON1, TNF- $\alpha$ , childhood obesity

**Funding:** Research relating to this abstract was funded by OTKA Hungary (K63025)

## T2:PS:177

**The influence of obesity and weight loss on anaerobic threshold**

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The aim of the study was to assess the anaerobic threshold before and after weight-reducing therapy in obese and normal subjects.

**Patients and methods:** 42 obese women (age 30.5±6.9 y, BMI=33.6±3.7 kg/m<sup>2</sup>) and 26 lean women (27.6±7.0 y, BMI=21.2±1.9 kg/m<sup>2</sup>) performed incremental ramp exercise test up to exhaustion on cycle ergometer. The test was performed again in 19 obese women after weight loss (mean 12.31±4.2%). The lactate threshold (LT and 4 mmol) and the ventilatory threshold (VT) was determined.

**Results:**

Thresholds	Obese (n=42)	Normal (n=19)	Obese (n=19)	
			before	after
LT	67,70±2,1	64,70±6,10	69,71±13,4 7	68,97±11,01
VT [W]	62,24±14,56	63,44±12,6 7	65,46±13,1 0	61,33±14,33
4 mmol	109,00±14,38** *	91,69±8,19	107,44±15, 9	118,69±15,82 <sup>##</sup>
LT	1,11±0,21**	0,94±0,15	1,12±0,21	1,13±0,15
VT [l/min]	1,05±0,17 <sup>S</sup> *	0,94±0,10	1,05±0,18	1,06±0,16
4 mmol	1,47±0,26***	1,25±0,25	1,45±0,29	1,60±0,20

\* p<0,05; \*\*p<0,01; \*\*\*p<0,001 O vs N

## p<0,01 before vs after

S p<0,05 LT vs VT [l/min] in O (n=42)

Obese in comparison to the lean women have higher lactate threshold. After obesity treatment both the lactate and the ventilatory threshold did not change, however 4 mmol lactate threshold was transferred to the right side.

RQ in obese subjects was lower than in normal one during the test.

**Conclusions:** The higher lactate threshold in obese women could be connected with increased usage of fat in supporting the energetic requirement.

In the obese women lactate threshold appears at higher oxygen consumption in comparison to the ventilatory threshold, whereas in the control group both thresholds occur at the same time.

## T2:PS:179

**Effects of sibutramine plus verapamil SR/trandolapril combination on blood pressure and metabolic parameters in obese patients with mild hypertension.**

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**Background:** Sibutramine administration has been proved efficacious in terms of weight loss but requires parallel monitoring of blood pressure and heart rate. Verapamil sustained release/Trandolapril 180/2 mg (Ve/Tra) is a fixed combination indicated for the treatment of hypertension in patients who require more than one agent to achieve blood pressure (BP) targets.

**Objective:** The primary end-point of this study was to evaluate the 6-month effect of sibutramine and Ve/Tra combination on blood pressure and heart rate in obese patients who had grade 1 hypertension (140-159 and/or 90-99 mmHg). Secondary end-points were the effects on anthropometric and metabolic variables.

**Methods:** Patients (n=32) received a low-fat low-calorie diet and prescribed a combination of sibutramine 10 mg and Ve/Tra 180/2 mg daily for 6 months.

**Results:** Combined treatment resulted in significant body mass index reduction. Significant reductions in systolic (SBP) and diastolic blood pressure (DBP) were observed (14.1% for SBP and 15.1% for DBP, p < 0.01) at the end of the 6-month treatment. After the 6-month treatment 78% of patients had BP readings below 140/90 mmHg. None of our patients experienced blood pressure increase during treatment. Heart rate did not significantly change during this period. Significant reductions were also observed in HOMA index, total cholesterol, triglycerides and low density lipoprotein cholesterol (LDL-C) (all p<0.05). Moreover, a significant decrease of small dense LDL-C, as well as of plasma visfatin levels, was observed.

**Conclusions:** The combination of Ve/Tra and sibutramine in obese hypertensive patients significantly reduced BP levels and improved anthropometric and metabolic parameters.

## T2:PS:178

**The influence of weight-reducing therapy with orlistat on solid phase gastric emptying**

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**Introduction:** The aim of the study was to assess the influence of eight-week weight reduction therapy with use of orlistat on solid phase gastric emptying in obese subjects.

**Patients and methods:** 40 obese women were enrolled into the study and randomly assigned to the weight-reducing treatment with use of orlistat (age 28.2 ± 6.3 y, BMI 37.7 ± 7.4 kg/m<sup>2</sup>) or placebo (age 28.8 ± 7.2 y, BMI 36.6 ± 5.6 kg/m<sup>2</sup>). All the subjects received weight reducing program consisting of fat- and simple carbohydrate-restricted 1200 kcal diet and regular physical activity (30 minutes three times a week). Gastric emptying was assessed with breath test method with use of the test meal (a pancake consisting of 355 kcal with addition of <sup>13</sup>C-octanoic acid) and evaluation of <sup>13</sup>CO<sub>2</sub> content in air samples taken after eating test meal.

**Results:** Weight reduction was 9.1 ± 4.1 kg (9.0 ± 3.2 %) and 5.8 ± 3.2 kg (5.9 ± 3.2 %) in placebo group.

	Orlistat group n =20		Placebo group n =20	
	Before	After	Before	After
Lag (minutes)	137.8 ± 26.5	143.8 ± 22.3	138.4 ± 25.3	132.1 ± 28.0
T1/2 (minutes)	188.4 ± 34.7	198.2 ± 36.3	190.7 ± 34.9	179.7 ± 38.6
GEC	3.3 ± 0.5	3.3 ± 0.3	3.1 ± 0.4	3.1 ± 0.4

**Conclusion:** Weight reduction does not alter the rate of solid phase gastric emptying. Eight-week use of orlistat as a complement of weight-reducing therapy also does not exert influence on gastric emptying.

## T2:PS:180

**Effect of exercise and diet intervention on the anthropometric measures and metabolic risk factors in Japanese**

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**Introduction:** Energy restriction in diet (D) and increasing physical activity (Ex) must be the primary lifestyle-intervention for improving the risk for developing metabolic syndrome (MS), which is a common cause of cardiovascular diseases. However, the inherent effect of each intervention on improving the anthropometric measures as well as the risks have not yet been clearly elucidated. This study investigated the effect of each Ex and D intervention on the anthropometric measures and metabolic parameters in patients with MS.

**Methods:** Twenty-one obese Japanese subjects (10 males, 11 females; age 40-75 years) who demonstrated risk factors regarding the diagnostic standards of the Japanese committee on MS, participated in a weight loss program during a 12-week period. The subjects were randomly assigned to either the D group or Ex group. The maximal oxygen uptake during a graded cycling test was assessed as an index of cardiorespiratory fitness. The percentage of whole body fat was measured by the underwater method.

**Results/Discussion:** Both groups achieved a substantial BW loss. The waist circumference and lean body mass significantly decreased in the D group, whereas they did not change substantially in the E group. In addition, the arteriosclerosis index and small dense LDL both significantly improved in only the E group. Our results suggested that exercise intervention has beneficial effects to improve the lipid profiles in MS without dramatically changing any anthropometric measures, including the waist circumference in comparison to diet intervention.

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## T2:PS:181

**Effect of Low Calorie Diet on Metabolic Syndrome Risks Factors in the Korean Obese**Lee, IH<sup>1</sup>, Lee, IS<sup>2</sup>, Son, JY, Kim<sup>2</sup>, YY<sup>1</sup>, Choue, RW<sup>1,2</sup><sup>1</sup>Research Institute of Clinical Nutrition, Kyung Hee University, Seoul, Korea<sup>2</sup>Graduate School of East-West Medical Science, Kyung Hee University Seoul, Korea

This study was conducted to investigate the effects of 12 weeks of low calorie diet (LCD) included in the nutrition counseling on metabolic syndrome risk factors in the overweight and obese men and women in Korea. A total of 44 subjects (17 men, 27 women) who were healthy and overweight or obese (BMI  $\geq 25$  kg/m<sup>2</sup>) took parts in the study during May-October, 2007. During the study period, the subjects attended nutrition counseling 4 times and consumed 1,100-1,300 kcal/day. Body weight, fat mass (FM), fat free mass (FFM), waist circumference, blood pressure, blood lipid profiles (triacylglycerol, total-cholesterol, HDL-cholesterol, LDL-cholesterol, free fatty acid), glucose, insulin, and HOMA-IR were measured at the beginning and end of the study. After 12 weeks of LCD, there were significant changes in body weight, FM, FFM, and waist circumference in both men and women. The means body weight loss for men and women were  $4.0 \pm 0.5$ ,  $4.8 \pm 0.7$  kg, respectively and the losses of fat mass were  $2.31 \pm 0.49$ ,  $2.03 \pm 0.15$  kg, respectively. The levels of plasma total-cholesterol and LDL-cholesterol decreased significantly and free fatty acid increased. HOMA-IR increased however, glucose and insulin levels were not changed significantly. The results confirmed that the low calorie diet had positive effects on the metabolic syndrome in both men and women through their weight reduction.

## T2:PS:183

**Nutritional consequences of adjustable gastric banding and gastric bypass in monitored patients: a one year prospective study**

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**Background:** While gastric bypass (GBP) is more efficient than adjustable gastric banding (AGB) on weight loss and comorbidities, we and others have previously shown that GBP is associated with a high frequency of nutritional deficiencies. Our goal was to assess the incidence of nutritional deficiencies in patients properly monitored.

**Methods:** We performed a one year-prospective study of nutritional parameters in 70 consecutive obese patients, who have undergone bariatric surgery, including 21 AGB and 49 GBP. After GBP, multivitamin supplements were systematically prescribed and vitamin B12 supplementation was introduced only if a deficiency was observed.

**Results:** Patients lost more weight after GBP than after AGB ( $40 \pm 13$  vs  $16 \pm 8$  kg,  $p < 0.001$ ). Only GBP induced significant decreases of vitamin -B12, -E, serum prealbumin and creatinin concentrations, with only minor clinical consequences. Vitamin B1, vitamin C and iron deficiencies were frequent but were not worsened by bariatric surgery. Anemia was observed in 10% of the patients after both procedures. Hemoglobin concentration was not correlated to vitamin B12 or folate concentrations but was related to iron status, which was better assessed by transferrin saturation than by ferritin in this obese population.

**Conclusion:** Severe nutritional deficits can be avoided after bariatric surgery if patients are systematically supplemented with multivitamin and carefully monitored. However, specific care is required to avoid iron and vitamin B12 deficiencies, anemia and protein malnutrition.

## T2:PS:182

**Cardiovascular load in response to isometric leg exercise in obese women before and after an integrated weight-reduction program**Brown CM<sup>1</sup>, Montani JP<sup>1</sup>, Dulloo AG<sup>1</sup>, Busti C<sup>2</sup>, De Col A<sup>2</sup>, Agosti F<sup>2</sup>, Sartorio A<sup>2,3</sup><sup>1</sup>Department of Medicine, Division of Physiology, University of Fribourg, Switzerland<sup>2</sup>Experimental Laboratory for Auxo-endocrinological Research<sup>3</sup><sup>rd</sup> Division of Metabolic Diseases, Italian Institute of Auxology, Milan and Piacavallo (VB), Italy

Isometric muscle contractions elevate heart rate and blood pressure, stressing the cardiovascular system. Because of the increased weight to support, obese individuals may be subject to particularly large isometric stresses in their everyday lives. We tested whether participation in a weight-loss program that comprises a substantial physical training component might have the beneficial effect of attenuating the cardiovascular responses to isometric exercise, either through improved muscle strength, autonomic function or both.

In ten obese female patients (age  $31 \pm 3$  years, height  $1.62 \pm 0.01$  m, initial weight  $103.9 \pm 2.7$  kg, body mass index  $39.6 \pm 1.0$  kg/m<sup>2</sup>) we measured heart rate and blood pressure responses to isometric leg contractions at 10, 20, 30 and 40% of the maximal isometric force. Autonomic function tests were also performed. After completion of the 3-week weight loss and training program, the patients had lost  $4.1 \pm 0.4$  kg ( $P < 0.01$ ). Maximal isometric force improved by  $39 \pm 10\%$ . Resting heart rate and blood pressure were significantly lower, as were the values of heart rate recorded during isometric contractions. However blood pressure values during isometric work were not significantly different after weight loss. There were no significant changes in autonomic function.

The reduction in heart rate at rest and during isometric exercise suggests a lower cardiovascular load during isometric stress in obese women after completing an integrated weight-loss program. A weight-loss program with a physical training component might therefore lessen the potential cardiovascular load experienced by obese individuals during everyday tasks.

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## T2:PS:184

**Psychiatric evaluation of patients candidates for bariatric surgery.**

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**Introduction:** Severe obesity has serious psychosocial consequences.

**Objectives:** measuring quality of life and handicap, incidence of depression and anxiety and comparing patients with a binge eating disorder (BED) or a depression with other patients.

**Methods:** 234 patients candidates for bariatric surgery were evaluated. By way of average of the structured interviews and self appraisal tests, handicap (WHODAS II), quality of life (WHOQOL and IWQOL-Lite), depression (Beck Depression Inventory), anxiety (Beck Anxiety Inventory), presence of BED (DSM-IV diagnostic criteria) and characteristics of the habits and alimentary behaviour (Eating Disorder Inventory) were measured.

**Results:** 50% of the patients suffer a moderate or severe depression and 32% suffer severe or moderate anxiety. Patients suffering a moderate or severe depression had a superior handicap and a quality of life significantly inferior to the one of the other patients without depression or with mild depression and patients with a BED were more depressed and felt more handicapped than patients with BED.

**Conclusion:** Amongst the patients suffering from severe obesity, patients suffering from depression or BED are the most affected by psychosocial disorders.

## T2:PS:185

**Self assessment of person-centered perceptions in the secondary care obesity setting: feasibility and utility**Brown, J<sup>1</sup>, Kulkarni, UV<sup>2</sup>, Broom, J<sup>2</sup><sup>1</sup>NHS Grampian, Aberdeen, Scotland<sup>2</sup>The Robert Gordon University, Aberdeen, Scotland

**Background:** In secondary care obesity management there is a real risk of overlooking day-to-day aspects of obesity and obese individuals' self perceptions, both of which have the potential to influence outcomes.

**Methodology:** Previously validated self assessment questionnaires were used to acquire data from a person-centered perspective of obesity. These assessments were obtained at first referral visits to a secondary care obesity clinic

**Results:** 94 individuals (79 females) provided assessments, ages 18-73 years with BMI 30.2-81.1kg/m<sup>2</sup>. 76.6% identified previous attempts at weight loss. Of those, 56.9% quantified up to 50 attempts and 43.1% were unable to enumerate attempts. Nobody wanted to lose <10% of their body weight and almost half (47.8%) wanted to lose >30%. Problems with activities of daily living in this sedentary group were high: 60.6% reported moderate/high scores for difficulty (correlation with BMI = 0.3, p <0.01). They reported high levels of food cravings, poor sleep, body pain, sweating and breathlessness. Statistically significant correlations were found between food cravings and guilt, boredom and poor sleep. Beliefs indicated that 72.9% felt responsible for their own weight. While responding to questions about external locus of control only 22.8% agreed.

**Conclusion:** Health professionals should take account of the perceptions of those who seek treatment for their obesity. Weight loss expectations and beliefs should be addressed before implementing weight loss interventions. We show the feasibility and utility of incorporating physical, emotional and social needs self-assessments into a secondary care obesity setting.

## T2:PS:187

**Type D personality obese patients have an increased risk for cardiovascular and metabolic complications**<sup>1,2</sup>Barbu C, <sup>1,2</sup>Sirbu A, <sup>2</sup>Georgescu O, <sup>2</sup>Minea L, <sup>2</sup>Ursache M, <sup>1,2</sup>Fica S<sup>1</sup>Carol Davila University of Medicine and Pharmacy, Bucharest, Romania<sup>2</sup>Elias University Hospital, Bucharest, Romania

Type D personality, a behavioral construct characterized by the tendency to experience negative emotions and to avoid social contacts, was associated with increased risk for cardiovascular morbidity

**The Aim:** of this study was to investigate the role of type D personality in the pathogeny of cardiometabolic complications in obese patients and to see if the activation of HPA axis involved in this personality construct is associated with a change in cortisol levels.

**Patients and Methods:** Clinical (BP, waist circumference, BMI) and paraclinical (HOMA-R index, lipid profile, basal and after 1 mg dexametasone suppression test plasma cortisol) parameters were evaluated in 74 severely obese patients. All patients completed a psychological questionnaire to assess Type D personality.

**Results:** 13.54% of the obese patients had features of type D personality. Type D personality patients had a higher prevalence of high blood pressure (80% vs 42.1%, p<0.05) and coronary artery disease (50% vs 20.3%, p< 0.05), as well as higher HOMA index (8.35 ± 2.4 vs 4.92 ± 3.12, p<0.01) and higher LDL cholesterol levels (154.78± 27.56 vs 123.82 ± 38.6, p<0.05) There was no significant difference between waist circumference, BMI, basal or suppressed cortisol levels between the two groups.

**Conclusions:** Type D personality obese patients have an increased prevalence of cardiovascular complications of obesity, but also have an altered lipid profile and increased insulin resistance. Screening for type D personality could identify a subgroup of obese patients with an increased risk for metabolic complications

## T2:PS:186

**Body composition and body image perception in portuguese and spanish college students: Comparative study between overweight/obese and normal weight women**Pereira, E<sup>1</sup>; Lacerda, F<sup>1</sup>; Valador N<sup>1</sup>; Ferro-Lebres, V<sup>1</sup>; Arroyo, M<sup>2</sup><sup>1</sup> Instituto Politécnico de Bragança – Escola Superior de Saúde, Portugal.<sup>2</sup>Universidad del País Vasco (UPV/EHU) – Facultad de Farmacia – Departamento de Nutrición y Bromatología, Spain.

**Objective:** To evaluate body image perception and compare with real measures of body composition between overweight/obese and normal weight women college students.

**Subjects:** The reported sample included 600 students from Portugal and Spain.

**Material and Methods:** The anthropometry variables: weight, height, skinfolds, circumferences and body mass index, waist-hip ratio, percentage of body fat and fat-free mass- FFM were compared with reference values. The body image perception and satisfaction were estimated using Somatomorphic Matrix and Body Shape Questionnaire (BSQ34).

With the difference between actual and ideal measures was obtained the dissatisfaction through body image. For data analysis was used t-test and Pearson correlation.

**Results:** 10,7% of the Spanish sample was overweight/obese. Statistical significance was found between real and ideal FFM (P<0,01), showing a medium body dissatisfaction. Fat mass was well estimated.

The Portuguese measures are elapsing now. The results will be finished before the congress date.

**Conclusions:** These results constitute a first approach of body image perception and satisfaction, in Portuguese and Spanish students.

Recent studies consider the cultural thinness preoccupation, the weight prejudice and disturbances in body image, mainly a discrepancy between perceived and ideal body image, extending beyond the health risks associated with obesity, and have become a serious problem. And the effect of body size and composition feedback is more pronounced in overweighted. Our study shows the importance of public health actions in the education of body image perception and satisfaction in Portugal and Spain, as a measure preventing eating disorders and other mental disturbances, especially between overweight/obese women.

**Key words:** body image, self-estimation, body mass index, overweight/obesity, Portuguese and Spanish women.

## T2:PS:188

**Short-term multidisciplinary therapy improves the resting substrate oxidation, food intake and body composition in obese Brazilian adolescents**Martinz, AC<sup>1\*</sup>, Carnier, J<sup>1\*</sup>, De Piano, A<sup>1\*</sup>, Gasques Filho, OM<sup>1\*</sup>, Caranti, DA<sup>1\*</sup>, Lofrano, MC<sup>1\*</sup>, Tock, L<sup>1\*</sup>, Lederman, H<sup>2\*</sup>, Ernandes, RMY<sup>3</sup>, Mello, MT<sup>3\*</sup>, Tufik, S<sup>3\*</sup>, Damaso, AR<sup>1,4\*</sup>.<sup>1</sup>Post Graduate Program of Nutrition, <sup>2</sup>Department of Diagnostic Imaging,<sup>3</sup>Department of Psychobiology, <sup>4</sup>Department of Health Sciences, <sup>5</sup>Association

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**Background and Aims:** The prevalence of overweight and obesity has increased dramatically in Brazil mainly as a consequence of disturbances in energy balance. In this way, it was verified the effects of short-term multidisciplinary therapy on resting metabolic rate, the rate substrate oxidation in resting, food intake and body composition in obese Brazilian adolescents.

**Methods:** Twenty post-puberty obese adolescents were enrolled, including 11 boys (BMI 36.00 ± 4.23 wt/ht<sup>2</sup>) and 9 girls (BMI 34.75 ± 3.70 wt/ht<sup>2</sup>). Resting metabolic rate and nutrient oxidation was measured by indirect calorimetry. Food intake was assessed by 3 days recordatory inquiry. Body composition was measured by Plethismography and visceral fat was analyzed by ultrasound.

**Results:** We could observe a significant decrease of body mass and BMI in both groups after six months of multidisciplinary intervention. Analyzing macronutrients intake, we verified a significant decrease of the FAT and carbohydrate (CHO) intake in both gender. The FAT oxidation presented a significant increase in both gender after therapy.

**Conclusion:** Our investigation demonstrated that short-term multidisciplinary therapy was effective to improve energy balance to promote obesity control. AFIP, FAPESP, CNPq and CAPES supported the CEPE-GEO Multidisciplinary Obesity Intervention Program. CENESP, FADA, FAPESP (CEPID/Sleep #9814303-3 S.T), FAPESP (200600684-3) UNIFESP.

## T2:PS:189

**Quality of life and problems of patients in early period after VBG and RYGB procedures.**

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**The Aim:** the subjective evaluation of the changes in the health-related quality of life (HRQL) of patients that undergone RYGB and VBG procedures early after surgery.

**Patients and Methods:** Between 2001-2007 160 patients developed bariatric surgery (122 women, 38 men; 96 - VBGs; 64 - RYGBs). Average weight-143 kg, BMI= 48,7 kg/m<sup>2</sup> and body fat - 51,3%. All patients were instructed about the necessary improvements in their behaviour and diet in the postoperative period and continued during the post op follow up: 2 weeks, 1,3,6 months after surgery.

**Results:** 98% of patients considered, that bariatric procedure improved their health, 92% admitted that complies with the dietary suggestions and has healthy lifestyle with adequate exercise. 85% of patients was satisfied with the outcome of the operation.

The most bothersome problems 6 months postoperatively were: feeling cold in 80% of, increased hair loss in 70%, nail brittleness in 56% of patients. There were also changes in the nutritional habits such as repugnance to meat in 73%, more willingness consume dairy and fish products. In the assessed group there was no statistically significant differences between the sexes and between the groups with VBG and RYGB procedures.

**Conclusions:**

1. As a result of a continuing education most patients improved their lifestyle and changed their nutritional habits.
2. Their self-assessment regarding their appearance and coping with the everyday life improved substantially.
3. Some of their problems that arose during the early postoperative period did not influence substantially their overall assessment of the results of the procedure.

## T2:PS:191

**Obesity – an image of nutrition errors within the family**

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**Introduction:** The present study is set to assess the impact obesity has over the members of one family.

**Material and Method:** We included in the study a number of 180 patients who were overweighted or obese. To all patients we assessed the age, gender, height, body weight, abdominal circumference, BMI. All patients responded to an application which contained questions related to feeding habits, to possible factors involved in the appearance of obesity, and to the presence of obesity per se to the other family members.

**Results:** 67% of our patients related about some others of their family members as being obese or overweight, while 72% of them were female patients. 39% of the family members who presented obesity were children or teens.

The causes that induced the weight increase: Giving up smoking at 38%; ceasing of the physical activity at 22%; sedentariness at 80%, stress at 55%; alcohol intake at 22% of patients, bad feeding habits; fast food intake at 25%, ingestion of hyper caloric food at 85%. Out of these patients, it is important to mention that only 30% of them appreciate in an objectivable manner that the excessive aliment intake as the cause which induces obesity.

**Conclusions:** Obesity within the family constitutes a major problem, due to its social and medical impact. It is important that the educational process regarding the nutritional elements to be extended over all the family members, in order to get aware and to correct the alimentary bad habits.

## T2:PS:190

**Heart sympathetic activity and pulmonary function in obese pregnant women. A longitudinal study**

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**Background:** During pregnancy it has been reported an increase in sympathetic activity and changes in pulmonary function. However, no longitudinal studies have evaluated these changes in women according to their body mass index or weight gain during pregnancy.

**Objective:** To evaluate heart sympathetic activity and pulmonary function in obese women during pregnancy.

**Material and Methods:** We evaluated 178 pregnant women (88 obese and 90 non obese) at first visit of pregnancy and at third trimester. In both visits we measured blood pressure, glucose, insulin, leptin levels and performed a 60 minutes electrocardiograph monitoring and forced spirometry.

**Results:** Blood pressure levels, glucose, insulin and leptin levels were significantly higher but forced expiratory volume at 1 s/ forced vital capacity (FEV1/FVC) ratio was lower in the obese group than in the non obese group at two evaluations during pregnancy. Total power and SD of all the R-R intervals (SDNN) were lower in obese than in non obese women at the beginning and at third trimester respectively. In the multiple regression analysis only SDNN change and obesity at the beginning of pregnancy independently of weight gain were associated to increase in LF/HF index (R<sup>2</sup>=0.21; p<0.0001 for the model). More pregnancy complications were found in the obese group independently of weight gain.

**Conclusions:** Heart sympathetic overactivity and lower FEV1/FVC ratio was found in obese women during pregnancy. The increase in LF/HF index at third trimester of pregnancy is associated with obesity at the beginning of pregnancy and SDNN change independently of weight gain.

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## T2:PS:192

**Weight loss and metabolic lipid profile after Sibutramine treatment in obesity**

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**Objective:** In obesity the medication is useful adjunct to diet and exercise. We proposed to determine the long-term weight loss maintenance under sibutramine (Reductil<sup>®</sup>) treatment and the efficacy of this drug on lipid profile.

**Material and Methods:** Thirty-four obese patients (25 women and 9 men) treated with 10 mg/day sibutramine for 12 months. The inclusion criteria: age 16 to 65 years, body mass index (BMI) ≥ 30 kg/m<sup>2</sup>, blood pressure ≤150/95 mmHg, pulse rate ≤ 90 beats/min. Clinical parameters was: waist circumference, hip circumference, waist/hip ratio.

At initial assessment and at 6 months were measured : serum fasting glucose, total - cholesterol (total-C), high-density lipoprotein cholesterol (HDL-C), low-density lipoprotein cholesterol (LDL-C) and triglyceride.

**Results:** Weight loss dropped from 95.3±10.2 kg to 85.7±10.2 kg (-10.1%) at 6 months and to 81.4±10.2kg (-14.6%) at 12 months. BMI fell from 34.8kg/m<sup>2</sup> to 31.7 kg/m<sup>2</sup> (6 months) and 29.9 kg/m<sup>2</sup> (12 months). The mean waist circumference decreased from 99.2 cm to 94.8 cm (6 months) and to 93.9 cm (12 months). Significant reduction from baseline to the 6 months for the lipid parameters: total-C from 215±38 mg/dl to 197.5±38 mg/dl; LDL-C from 126.9±24 mg/dl to 110.6±24 mg/dl; triglyceride from 129.1±46 mg/dl to 110.1±46 mg/dl; HDL-C risk from 43.7±8.6 mg/dl to 46.26±8.6 mg/dl.

**Conclusion:** Sibutramine therapy and lifestyle for 12 months in obesity management resulted in weight loss. The weight loss was paralleled by a favorable metabolic lipid profile for six months. Drop-out to 12 months was at 22 patients (35.2%).

## T2:PS:193

**Advantages of therapy with glargine insulin and metformin versus NPH insulin and metformin in patients with diabetes mellitus type 2 associated obesity**

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**The Aim:** of the study is to compare the efficacy and the tolerability of therapy with insulin glargine versus NPH insulin in patients with diabetes mellitus type 2 with obesity.

**Method:** 60 obese patients poorly whom type 2 diabetes was not well controlled, who were treated initially with NPH insulin once daily + metformin, were switched on therapy with insulin glargine once daily + metformin. Insulin dosage was titrated to target FBG  $\leq 100$  mg/dl using a weekly forced titration algorithm. In time (initial, at 3 and 6 months) we evaluated BMI, fasting blood glucose (FBG), HbA<sub>1c</sub>'s value and the number of hypoglycemic symptomatic episodes.

**Results:** After 6 months of therapy with insulin glargine we obtained an important lowering in FBG (190,3 $\pm$ 22,7 mg/dl vs. 115,6 $\pm$ 13 mg/dl -  $p < 0,001$ ), HbA<sub>1c</sub>'s value (8,9 $\pm$  1,8% vs. 6,8 $\pm$  0,8% -  $p < 0,001$ ) without an important increasing in BMI value (36,2 $\pm$ 3,1 kg/m<sup>2</sup> vs. 34,4 $\pm$ 3,7 kg/m<sup>2</sup> -  $p > 0,05$ ). Timing of administration of the insulin glargine (8 a.m. or 10 p.m.) didn't have an important influence on FBG value (98,5 $\pm$ 10,3 mg/dl vs. 110,3 $\pm$ 13,2 mg/dl) or on HbA<sub>1c</sub>'s value (6,7 $\pm$ 0,8% vs. 6,9 $\pm$ 0,8%) when these were evaluated at 6 months. At patients treated with insulin glargine, the risk for symptomatic hypoglycemia is 1.8 times lower than in the group treated with NPH insulin.

**Conclusions:** Insulin glargine therapy with metformin in patients with diabetes mellitus type 2, who were also obese, is associated with a better metabolic control, even on a short period (expressed by FBG) of time but also on a long period of time (expressed by HbA<sub>1c</sub>) without an increasing in body weight. Timing of insulin administration hasn't any influence on the metabolic control.

**Key words:** glycemic control, hypoglycemia, insulin glargine, diabetes mellitus type 2.

## T2:PS:195

**Practical aspects of psychological counseling of patients with bulimia nervosa (bn)**Tarasova, I<sup>1</sup>, Kopitko, M<sup>1</sup>, Ionova, L<sup>1</sup><sup>1</sup>Medical Center "Dr. Ionova's clinic", Moscow, Russia

The study into the problem of treatment of patients with BN has been carried out. The number of patients – 23 females, aged 18-23; duration of counseling - weekly sessions for an hour during 3 months. Based on preliminary psychological diagnostics (MMPI, Lusher test, Spielberger's State Anxiety, Beck Depression Inventory, TAS-20), the tasks of counseling were set. With the numerous tasks and a complex character of the disease, it is advantageous to use a combination of different methods of psychotherapy. At the beginning of counseling, the use of relaxing methods, Art Therapy caused lowering of internal stress and anxiety, and gave rise to internal resources activation. Then therapeutic efforts were focused on resolution of personal and interpersonal conflicts. To replace distractive nutritional habits and irrational thoughts we used the CBT techniques. For realization of own feelings and needs, for responding to negative emotions, for integration of internal contradictions, Art Therapy and Gestalt Therapy were used. Repeated diagnostics showed: reduction in situational anxiety ( $P < 0.0065$ ) and depression ( $P < 0.014$ ); widening of range of emotional response; increase in assertiveness; rise in social activity. Against the background of improvement of emotional state, bulimia symptoms reduced. Also, we could notice a change in quality of doing drawing tasks. Previously formal and fragmentary drawings gradually came to be detailed and filled with emotions. Consequently, complex psychotherapy of patients with BN makes it possible to attack the problems thoroughly thus affording the positive changes to be made. For the effective treatment, the long-term systematic psychological counseling is required.

## T2:PS:194

**Betahydroxybutyrate level changes during exercise test as a predictor weight reduction?**Matoulek M<sup>1</sup>, Stránská Z<sup>1</sup>, Šupová R<sup>1</sup>, Fábin P<sup>1</sup>, Vilikus Z<sup>2</sup>, Svčina Š<sup>1</sup><sup>1</sup>3.interna clinic 1<sup>st</sup> Medical Faculty, Charles University in Prague, <sup>2</sup>Department of Sport Medicine, 1st Medical Faculty, Charles University in Prague

**Introduction:** Prediction of effect weight reduction is important for compliance of patients during weight reduction process. The changes of betahydroxybutyrate (BOH) level as a marker ketogenesis during one-day starvation test and as a predictor of weight reduction have been demonstrated.

**Aim of Study:** The changes of BOH level during CHR (clamped heart rate) exercise test and their relation to weight reduction during three month programme with physical activity (TPPA).

**Characterization of Group:** 44 obese (34 female + 10 male) with 47,1  $\pm$  9,07 yo average, BMI 34,9  $\pm$  5,8 kg/m<sup>2</sup> a 37,9  $\pm$  7,1 % fat mass.

**Methods:** Patients with overweight and obesity attended TPPA on training heart rate (THR) prescribed after spirometry and CHR test. BOH level was measured before 40 minutes exercise test (BOH1), after test (BOH2) and 60 minutes after test (BOH3). The changes of BOH level during test and after 60 minutes resting were compared with weight changes during TPPA.

**Results:** There were no significant changes in BOH1 a BOH2 levels (0,12 mmol/l vs. 0,11 mmol/l). Increase of BOH level was observed between BOH1 a BOH3 (0,12 mmol/l vs. 0,31 mmol/l;  $p < 0,001$ ). The significant change weight reduction was observed during TPPA (100,8 kg vs 97,2 kg ;  $p < 0,001$ ). Weight reduction positive correlates with difference of BOH level on the start of exercise test and after 60 minutes resting after test DIFBOH1-3 ( $r = -0,428$ ;  $p < 0,05$ ).

**Conclusion:** It seems that CHR test with assessment of BOH level during test and after resting could predicate weight change during weight reduction programme with physical activity. We should compare results of exercise test and BOH level group dividing according weight changes during TPPA (minimal weight changes or patients with not finished TPPA). It could help with identification of "unsuccessful patient" or method. Another methods or combine with other methods than only physical activity programme should be prescribed in patients if weight reduction can not be predicated after TPPA.

There is no conflict of interest. Funded partly in project Health plus

## T2:PS:196

**Comparison of dietary habits and leisure time activities in school children of rural and town population in relation to obesity**Boledovičová M. <sup>1</sup>, Šaradyová L. <sup>1</sup>, Svčina Š. <sup>2</sup><sup>1</sup> University of Konstantin Philosopher, Nitra, Slovakia<sup>2</sup> Charles University, 1st Medical Faculty, Prague, Czech Republic

The aim of the study was to evaluate dietary habits and leisure time activities in school children 6 to 10 years (1st to 4th class of elementary school) in the middle European region. Two methods were used: interview of the child and questionnaire given to the parent. Two hypotheses were set: 1. There are differences in children diet and leisure time activities in a small village (Horná Streda- Slovakia and in a big city Prague- Capital of Czech Republic). 2. Obesity and education of parents has some impact on children. By questionnaire or by interview 113 children in Prague and 95 children were evaluated.

**Results:** The prevalence of higher than normal BMI was from 1st to 4th class in the small village: 25%, 50%, 43%, 33%, in the big town 25%, 14%, 22%, 14%. Children in the big town are eating more fried food and fast food but children in the small town are eating more fatty home made food. Children in the town have more leisure time activities.

Obesity in children is more prevalent in families with obese parents in both samples. In both samples no relation was found of parents educational status (basic, middle school, university) to obesity in children.

**Conclusion:** There are more obese children in the small village and in both samples there is an influence of parents BMI on children BMI. Education of parents had no effect on obesity in children. Special programs for diet education are needed especially in rural population. There is no conflict of interest. Partly funded by the 6th framework EU project Health Plus.

## T2:PS:197

**Comparison of low energy breakfast based on special egg white spread product with a standard breakfast**

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The aim of the study was to evaluate the influence of low calorie breakfast in comparison to standard low fat cheese breakfast. A special spread based on egg white was used. Egg white derived products are widely used for weight reduction in our country. Glucose level, insulinaemia and C peptide were evaluated in 0, 60, 120 minute after breakfast. Psychological questionnaire was used to evaluate the taste and satiety. 12 persons were tested on different days with both types of breakfast: mean age 38.5±10.7 years, mean BMI 24.6 kg/m<sup>2</sup>.

**Results:** Standard breakfast: insulinaemia 6.3...34.6...11.0 IU, C peptide 0.6...1.6...1.0 pmol/l, glucose 5.0...5.4...4.8mmol/l Low energy breakfast: insulinaemia 6.6...24.6...10.7 IU, C peptide 0.6...1.4...1.0 pmol/l, glucose 4.8...5.1...5.0 mmol/l. Paired t-test was used for evaluation. Now difference in blood glucose level was found, borderline significances of insulinemia in 60 minute (p= 0.056) and in C peptide (p= 0.089). Significant difference in decrease of insulinemia between 60 and 120 minute (p= 0.03) and borderline significant decrease in C peptide (p=0.055) shows shorter insulin secretion after low calorie breakfast and good insulin sensitivity in this group of lean subjects. Higher satiety and worthier taste were found using low energy breakfast.

**Conclusion:** Low calorie breakfast induces lower and shorter insulin secretion and has a good metabolic effect in lean subjects. Testing in obese subjects will follow. Egg white derived low calorie products have a beneficial effect on insulin response without any difference in ingested carbohydrate quantity. Funded by the project MŠMT2B 06172.

## T2:PS:199

**Effect of Dietary Regime on Serum Phospholipid Fatty Acid Composition in Overweight/Obese Patients**

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Diet is the primary therapeutic approach for persons with increased risk of premature heart disease as a result of elevated cholesterol levels. The aim of this study is to observe changes in fatty acid (FA) composition between males and females in their response to a dietary regime.

The study involved 20 overweight/obese women and 15 overweight/obese men (aged 55±6, BMI>25kg/m<sup>2</sup>) with middle hypercholesterolemia (total cholesterol>5.2 mmol/l and <7.8mmol/l). Patients followed an AHA-Step 1 diet for 12 weeks. Main goal of the dietary treatment was to reduce energy intake from saturated plus trans unsaturated fats to no more than 10% and replace them partly with monounsaturated and polyunsaturated (fish recommended as main meal once of twice a week) fats, and to increase intake of fruit, vegetables, and dietary fiber. Patients' dietary regime was analysed using NUTPLAN, a software with wide applications among which are recipe calculation and diet planning, harmonised with EuroFIR recommendations. Serum phospholipid (PL) fraction was isolated by one-dimensional thin layer chromatography. PL FA composition was determined using gas chromatography.

In overweight/obese hypercholesterolemic patients statistically significant difference in total cholesterol, saturated FA, n-6 and n-3 FA was not found between genders. After AHA-Step 1 diet, total cholesterol and saturated FA decreased and n-6 and n-3 FA increased in serum PL.

Our results indicate that PL FA composition could be a valuable biochemical parameter that would enable planning and follow-up of nutrition treatment in overweight/obese patients with middle hypercholesterolemia.

This work was completed on behalf of the EuroFIR Consortium (FOOD-CT-2005-513944)

## T2:PS:198

**The estimation of effectiveness of low caloric diet with special product for treatment of patients with obesity**

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**Objectives:** The effectiveness of dietary treatment for patients with obesity based with to study the body composition dynamics.

**Material & Methods:** There have been examined 230 patients with obesity. All the patients were given diet with 1400 kcal energy (20% protein, 30% fat) with supplement of fibres or extracts of cafe and tea, or special protein product with complex of vitamins, during three weeks. We estimated of anthropometric data and body composition by bioimpedansmetria, physical activity fixed by an accelerometer "Caltrac".

**Results:** The fat free mass and total body water were higher, and the fat mass was lesser in the old people. The fat free mass and total body water were lesser, and the fat mass was higher in the obese people. The level of physical activity was lesser in the old men. Before treatment an average diet energy value was 3120±180 kcal for men and fat content more 38% by energy.

In 21 days body weight has reduction under the influence of diet therapy comprised from 4,8% to 6,4%. Waist measurement of obesity patients reduced 3,6-4,8% correspondingly. Hips reduced 2,1-4,2%. The waist/hips ratio reduced not significantly. Fat mass reduction: 5,6-8,5%; fat free mass reduction – 1,3-3,8%. Fat free mass quote relative increase: 0,8-1,4%. Water component reduction: correspondingly 1,4-6,1%.

**Conclusion:** The most effectiveness demonstrated of diet with a supplement of fibres.

## T2:PS:200

**Study of glucose levels and HbA1c in obese patients treated with orlistat, rimonabant or sibutramine compared to placebo through a metaanalysis**

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**Objectives:** By means of a metaanalysis were compared results from different clinical studies with the objective of evaluate the reduction of the glucose levels and HbA1c in obese patients treated with orlistat, rimonabant or sibutramina compared to placebo.

**Methodology:** The selection criteria were: patients with at least 18 years old, with a BMI between 27 and 30 kg/m<sup>2</sup> both bounds included, with one or two comorbilites related with the obesity. Double-blind, controlled randomized with any of the three medications of the study and with a minimal duration of 1 year.

A number of 27 studies published during the last 5 years were selected. The selection was conducted through MEDLINE, EMBASE and the Cochrane Controlled Trials Registers databases.

By means of the Delphi index the quality of the studies were evaluated. All the studies were considered with a good quality with an index greater or equal to 5.

**Results:** Orlistat showed a net glucose reduction significantly superior to zero and a slightly advantage to sibutramina. The patients treated with rimonabant did not present variations in the glucose levels.

Orlistat, besides to present minor variability, showed a bigger reduction of HbA1c (0.39%) in comparison with rimonabant (0.35%) and sibutramina (0.26%).

**Conclusion:** Orlistat and Sibutramina presented a significant reduction of the glucose levels. Regarding the HbA1c, the three medications presented significant reductions where orlistat was the drug with the bigger reduction in addition of the minor variability.

## T2:PS:201

**Beneficial change in lifestyle of overweight and obese subjects after treatment with Orlistat**Handjiev Sv<sup>1</sup>, Handjieva – Darlenska T<sup>2</sup><sup>1</sup>Medical Faculty, Medical University - Sofia, Bulgaria; <sup>2</sup>National Multiprofile Transport Hospital "Tzar Boris III" - Sofia, Bulgaria

**Introduction:** We have previously reported that overweight and obese subjects reduce their daily fat intake during and after treatment with Orlistat.

**Aim:** The aim of the study was to evaluate the changes in lifestyle, resp. in fat intake of overweight and obese subjects after treatment with Orlistat.

**Materials and methods:** The study group consisted of 96 patients - 65 women and 31 men (mean age 45.2 years, mean BMI 44.6 kg/m<sup>2</sup>, mean fat mass 41.6 %, mean waist circumference 110 cm). They were examined for a 7 – month period: in the first 4 months patients undergone a diet and received Orlistat 120 mg twice/daily; the last 3 months – only diet. Anthropometric evaluations were performed at the beginning and at the end of the study. The fat intake was measured using patient's food diaries.

**Results and discussion:** At the end of the fourth month 3 women and 1 man dropped out.

Our results demonstrated that the average fat intake decreased from 108 g/daily to 56 g/daily at the fourth month and to 50.2 g/daily at the end of the study. Moreover, we observed changes in the anthropometric parameters as follows: BMI decreased with 6.8 %, mean waist circumference became 94 cm and fat mass – 30.8 %.

Our results suggest that Orlistat 120 mg, given twice/daily, leads to beneficial change in lifestyle of overweight and obese subjects after the treatment.

## T2:PS:203

**Study on the effect of high – protein diet and Orlistat in the treatment of severe obese patients. (Initial data)**Handjiev Sv<sup>1</sup>, Lozanov L<sup>2</sup>, Ivanov V<sup>3</sup>, Handjieva-Darlenska T<sup>4</sup>, Petrov A<sup>2</sup>, Pachunkova S<sup>3</sup><sup>1</sup>National Multiprofile Transport Hospital "Tzar Boris III"- Sofia; <sup>2</sup>Tokuda Hospital – Sofia; <sup>3</sup>Military Medical Academy – Sofia; <sup>4</sup>Medical Faculty, Medical University – Sofia

**Introduction:** There are data in the literature indicating the role of the high – protein diet and its satiety effects in the management of the obese patient.

**Aim:** The purpose of the study was to evaluate the effects of high – protein diet together with Orlistat in the treatment of the heaviest man in Bulgaria.

**Materials and methods:** We performed our study in 41 – year old man with body weight 270 kg, BMI 81.2 kg/m<sup>2</sup>, waist circumference 200 cm, fat mass 48.7 %.

The patient undergone treatment with diet (proteins 20 en.%) and Orlistat 120 mg 3 times/daily for 6 – month period. In this case it was impossible to advise increase in the physical activity.

**Results:** At the end of the study we found body weight reduction with 40 kg, waist circumference decreased with 22 cm and fat mass – with 12 %. We observed an improvement in the cardio – vascular parameters and psychological state.

**Discussion:** Our data show that the combination of high – protein diet with Orlistat 120 mg have a beneficial effects on the anthropometric parameters in severe obesity.

## T2:PS:202

**The influence of the family in the treatment of the childhood and adolescence obesity**Vaccaro S<sup>1</sup>, Amari S<sup>2</sup>, Caselli G<sup>2</sup>, Lo Scocco S<sup>2</sup>, Cantoni S<sup>2</sup><sup>1</sup> Dietitian Service, <sup>2</sup> Division of Pediatrics, Azienda Ospedaliera Santa Maria Nuova, Reggio Emilia, Italy

The childhood and adolescence obesity is in constant increase in Italy, with a prevalence in the province Reggio Emilia above the regional and national average. The Division of Pediatrics has a multidisciplinary outpatient department for the treatment of obesity, with different professional figures: paediatric endocrinologist, nutritionist, dietician and psychologist. The work-up starts with a clinical and dietetic evaluation, which can be followed by psychological talks. 34 obese children (16 males, 18 females, age 11.44±2.89 years [4-17 years]) showed a weight of 69.14±22.63 kg [27.5-123.6 kg], height 1.5±0.15 m [1.07-1.82 m] and BMI 29.78±5 kg/m<sup>2</sup> [20.24-37.72 kg/m<sup>2</sup>].

During first visit child and family alimentary consumptions were collected and presented to the family to spots most common errors and instruct for a more correct feeding. A second visit was carried out at 30-45 days distance to verify correct application of previous counselling and eventual nutritional modification; if lab results show metabolic alterations an individual diet is designed.

!3 over 34 children had a pathological obese first degree relative within the family

When present a member of the family in weight excess the child would change effectively his/her alimentary habits (p 0,0009) and/or will present with increasing body weight during follow-up (p 0,0015), furthermore compliance to diet counselling is extremely low (p<0,0001). The family and the presence of obesity in other members or the family has a fundamental influence on the treatment of children affected by pathological obesity.

## T2:PS:204

**BMI and mortality risk in a group of institutionalized elderly men from Madrid**

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**Introduction:** The traditional method for determining whether a person is overweight or obese is to determine his/her body mass index (BMI), but it doesn't work very well in the elderly. Numerous studies report a U or J shape relationship between BMI and mortality in adults, but in elderly people this is not so clear.

**Material and methods:** In January 2000, anthropometric data of 63 institutionalized men from Madrid (aged 65 and over) were collected (weight, height, skinfolds and body circumferences), following the norms set out by the WHO. Subjects were classified as low-weight, normal-weight, overweight (OW) or obese (OB). Mortality data were taken from the sanitary records three years later.

**Results:** BMI ranged from 16.5 to 43.7 kg/m<sup>2</sup>. 25.6% of the group had died in the 3 years after the onset of study. In the whole group, BMI is a protection factor for mortality (OR: 0.7; CI: 0.8-0.9; p<0.01). Taken into account the established BMI groups, the BMI is a protection factor in OW group (BMI between 25 and 30 kg/m<sup>2</sup>) (OR: 0.3; CI: 0.1-1.0; p<0.05), while BMI is neither a protection nor risk factor for mortality in the other groups.

**Conclusions:** In our elderly male group, a slight overweight seems to be a protection factor for mortality. The 25 kg/m<sup>2</sup> normal limit for BMI may therefore be too restrictive in elderly men, and the appropriate BMI for this age group could be higher.

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## T2:PS:205

**Serum concentration of leptin and insulin in adolescents with hypertension and obesity**

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**Introduction:** Obesity is very often combined with metabolic disorders: hyperinsulinaemia, hyperleptinaemia and hypertension. These disorders can have their origin in adolescence.

**The aim of the study:** was the assessment of leptin and insulin concentration in young hypertensives with obesity.

**Material and Methods:** The examined group included 27 patients at the age of 17 to 19 with primary hypertension and overweight and/or obesity. Average BMI in examined group was 31,4 +/- 4,5 kg/m<sup>2</sup>, average value of diastolic blood pressure was 148 +/- 5,9 mmHg, and systolic blood pressure 92 +/- 4,6 mmHg. The control group included 22 patients in similar age with proper blood pressure values, BMI 27,1 +/- 3,9 kg/m<sup>2</sup>. Insulin and leptin were described by radioimmunological methods.

**Results:** Average insulin concentration in patients with obesity and hypertension was 14,88 +/- 7,7 µIU/ml, whereas in control group 9,2 +/- 3,2 µIU/ml. Average leptin concentration in group with obesity and hypertension was 20,7 +/- 7,9 µg/ml, in control group 14,8 +/- 4,1 µg/ml. These results were statistically significant (p<0,05)

**Conclusions:** Insulin as well as leptin showed higher values in group of patients with obesity and hypertension and this change was statistically significant.

## T2:PS:207

**A case of fatal severe early onset obesity due to a leptin receptor mutation in an Iranian family**Lessan N<sup>1</sup>, Ghodsi M<sup>1</sup>, <sup>2</sup>Farooqi I S, Larijani B<sup>1</sup><sup>1</sup>Endocrinology and Metabolism Research Center (EMRC), Tehran University of Medical Sciences, Tehran, Iran.<sup>2</sup>Institute of Metabolic Science, Addenbrooke's Hospital, Cambridge, UK.

It is estimated that up to 40-70% of obesity is attributable to genetic factors. The prevalence of overweight and obesity among Iranian children (Kelishadi et al, 2003) is 8.82% and 4.5% respectively. The prevalence of monogenic forms of obesity has not previously been studied in the Iranian population.

We present the first patient with a monogenic obesity syndrome identified in Iran. The patient presented with a history of extreme hyperphagia, rapid progressive weight gain and recurrent infections. He was born through a normal pregnancy in a highly consanguineous marriage. His birth weight had been normal. At age of 18 months he weighed 28 kg. Apart from obesity and incidental syndactyly of second/third digits in both feet, there were no other abnormalities on physical examination. His fasting serum leptin was 45 ng/ml, consistent with the degree of obesity. Genotyping revealed the patient to be homozygous for a 66-bp deletion in codon 514 of leptin receptor gene. At the age of 22 months he was admitted to the local intensive care unit with a severe respiratory tract infection. Unfortunately he did not respond to intensive treatment and died following a cardiorespiratory arrest.

Leptin receptor mutations can be associated with altered immunity and recurrent infections in association with severe obesity. Genetic assessment is recommended in severely obese patients especially those with a childhood onset.

## T2:PS:206

**Hip circumferences to body weight rates and cardiometabolic risk markers in obese women**Bayraktaroglu T<sup>1</sup>, Kutluturk F<sup>2</sup>, Azezli AD<sup>1</sup>, Orhan Y<sup>3</sup><sup>1</sup>Zonguldak Karaelmas University, Faculty of Medicine, Endocrinology and Metabolism<sup>2</sup>Gaziosmanpasa University, Faculty of Medicine, Endocrinology and Metabolism<sup>3</sup>Istanbul University, Istanbul Faculty of Medicine, Endocrinology and Metabolism

**Introduction:** We analysed the relationship between hip circumferences to body weight rates and cardiometabolic risk markers in obese women.

**Materials and Methods:** Selected subjects recruited retrospectively from outpatient clinic for this study were 5835 overweight or obese women. Their hip circumferences to body weight (HC/BW) rates were calculated. Median HC/BW ratio was 1.378, then subjects divided to low HC (HC/BW is <1.378) and high HC (HC/BW is > 1.378). Thereafter, we determined and compared body compositions (body mass index, abdominal fat mass), resting blood pressures, plasma lipoprotein levels, glucose homeostasis and other related biochemical parameters.

**Results:** There were 2913 (49.9 %) subjects in low HC group and 2922 (50.1%) subjects in high HC group. Mean BMI, body fat mass, waist circumferences, abdominal fat mass, systolic and diastolic blood pressures, fasting glucose, fasting insulin, HOMA values, total cholesterol, triglycerides, uric acid and high sensitive C-reactive protein levels, counts of leukocytes, liver transaminase activities, were significantly higher in low HC/BW group than high HC/BW group (p<0.05). But mean age was not different between groups (p>0.05). Mean HDL-cholesterol and LDL-cholesterol levels were lower in low HC/BW group than high HC/BW group (p<0.05)

**Conclusion:** It was shown that increased hip circumferences decrease cardiovascular risk factors and incidence of type 2 diabetes. In conclusion, obese or overweight women with high hip circumferences corrected and calculated to body weight, have lower cardiometabolic risk markers than women who have low hip circumferences to body weight.

## T2:PS:208

**Low caloric diet therapy with enhanced satiation by ear acupuncture, herbal medicine and supplementary food on outpatient basis**

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**Introduction:** Obese patients were classified in two groups by physical constitution. That is; Boiougito group with perspiration and no constipation, and Bofutsushosan group with no perspiration and persistent constipation. To provide a feeling of satiation in both groups, a therapy combining ear acupuncture (stomach, god gate, brain point), the ingestion of herbal medicine and supplementary drink (cocoa, soy bean powder, wheat germs, honey, fructose) mixed with soybean milk has found to be successful in treating overweight patients (more than one thousand patients) on an outpatient basis. **Methods & Results:** Two weeks after sustained auricular acupuncture in stomach point, depressant to the feeding center, 3,4-dihydroxybutylic acid (3,4-DB) increased from 174.3±89.8 to 305.7±104.8 µmol (p<0.05, n=7). After ingestion of supplementary drink with soybean milk, stimulant to the feeding center 2,4,5-trihydroxypentanoic acid (2,4,5-TP) decreased from 332.8±208.8 to 124.1±87.8 µmol (p<0.05, n=5). Obese patients were well tolerated the low caloric diet therapy. Among them, 8 obese patients of BMI of 31.6±1.3 rapidly reduced 18±5 Kg in 5.7±1.8 months. Prior to the treatment systolic radial pressure increased following the detection of the stomach point in the ear lobe but not at the immediately after weight loss. **Conclusion:** Both ear acupuncture in the stomach point and the ingestion of the supplementary drink developed adequate satiety to reduce food intake and excess weight. Classification of obese patients in Boiougito group and Bofutsushosan group helped the reduction in weight loss.

### Track 3: Metabolic Syndrome

#### Track 3 ISC Abstract Selected Posters

##### T3:PS.01

#### The activity of nuclear factor- $\kappa$ B (NF- $\kappa$ B) in circulating mononuclear cells and muscle but not in subcutaneous adipose tissue is associated with central obesity but not physical activity in non-diabetic adults

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**Objective:** A sustained activation of nuclear factor- $\kappa$ B (NF- $\kappa$ B) is thought to underlie the inflammation related metabolic consequences in obesity. To this end, we investigated relationships between NF- $\kappa$ B in white blood cells, skeletal muscle and adipose tissue and measures of obesity and physical activity.

**Research design and methods:** Adiposity (DEXA), waist-to-hip ratio (WHR), physical activity (iPAQ questionnaire [www.ipaq.ki.se](http://www.ipaq.ki.se)) and fitness (VO<sub>2</sub>max) were measured in 21 non-diabetic volunteers. NF- $\kappa$ B p65 activity was measured by DNA-binding obtained from percutaneous biopsy of vastus lateralis muscle, subcutaneous adipose tissue biopsies and in peripheral blood mononuclear cells (PBMC) lysates.

**Results:** NF- $\kappa$ B activity in both PBMC and muscle were related to WHR ( $r=0.48$ ,  $p=0.03$ ;  $r=-0.61$ ,  $p=0.003$ ) but not % body fat ( $r=0.20$ ,  $p=0.4$ ;  $r=-0.01$ ,  $p=0.9$ ). NF- $\kappa$ B activity in both PBMC and muscle were related to WHR even after adjustment for age, sex, and % body fat (both  $p<0.03$ ). pNF- $\kappa$ B activity in adipose tissue however, was not related to % body or WHR (both  $p>0.1$ ). NF- $\kappa$ B activity in PBMC, muscle or adipose tissue were not related to physical activity or fitness (all  $p>0.1$ ).

**Conclusions:** These data show a relationship between NF- $\kappa$ B activity in PBMCs and in skeletal muscle and central adiposity but not overall adiposity; and no relationship with physical activity in non-diabetic individuals. The association of NF- $\kappa$ B with central adiposity is novel and could help explain the adverse metabolic effects of central adiposity.

**Funding:** This work was completed with support from Besselong and Pfizer Cardiovascular Lipid Grants, the Juvenile Diabetes Research Foundation (JDRF) and the National Health and Medical Research Council of Australia (NHMRC).

##### T3:PS.03

#### High molecular weight adiponectin is raised in cord blood of newborns, but is unaffected by pre-eclamptic pregnancies.

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**Objective:** The adipocyte-derived adipokine adiponectin exhibits anti-inflammatory, antiatherogenic and antidiabetic roles, as well as insulin-sensitizing properties. It is abundant in human plasma where it circulates as several characteristic multimeric forms: the high molecular weight HMW-form is supposed to be the most active form. This study is the first to report HMW-adiponectin in newborns of normal and pre-eclamptic pregnancies (PE). Newborns of PE-mothers have a greater susceptibility to metabolic syndrome linked diseases in adult life.

**Study design:** Cross sectional, hospital-based study dealing with adiponectin levels in newborns to mothers with pre-eclampsia. Venous cord blood samples were collected immediately after birth; 30 cases and 62 controls were enrolled into the study. The study was approved by the local ethics committee and all participants gave written consent.

**Methods:** Total- and HMW adiponectin were measured by commercially available Enzyme-Linked ImmunoSorbent Assay.

**Results:** The main outcome was that total adiponectin level was high in newborns. No differences in adiponectin levels were found between case and control groups when corrected for gestational age (GA). In combined groups:  $\log(\text{total adipo}) = 0.40 + 0.027 \cdot \text{GA}$ ;  $r = 0.38$ . Furthermore, the HMW form was the dominant form of adiponectin ( $\text{HMW adipo} = -5.06 + 0.81 \cdot \text{total adipo}$ ;  $r = 0.90$ ).

**Conclusion:** Newborns exhibit higher adiponectin levels than adults and the elevated total adiponectin level is mainly explained by the presence of HMW-adiponectin. Its role in early post-natal life and is yet unknown. There is no apparent association between newborns' adiponectin levels and pre-eclampsia in our study.

##### T3:PS.02

#### Mechanism of Action of Metformin on Insulin Sensitization: Selective Fatty Acid Oxidation (FAO) over Glucose Oxidation via Inhibition of Complex I and Activation of AMP-activated protein kinase in C2C12 myocytes

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Metformin is a potent antihyperglycemic agent as well as an insulin sensitizing agent. Two mechanisms of action have been proposed in mediating its effect, inhibition of complex I of mitochondrial electron transport chain (ETC) and activation of AMP-activated protein kinase (AMPK). In this study, we investigated the relationship between the two mechanisms taking the unique approach of measuring simultaneously oxygen consumption rate (OCR) and glycolysis rate in C2C12 myocytes treated with metformin. Inhibition of complex I by either metformin or phenformin lowered basal OCR and elicited a compensatory increase in glycolysis rate as measured by an increase in extracellular acidification rate (ECAR). In metformin-treated cells, palmitate addition induced an increase in OCR while glucose did not suggesting that metformin-treated cells selectively oxidize fatty acids over glucose. Palmitate-CoA can transfer electrons directly to ubiquinone in the ETC via ETF dehydrogenase while glucose cannot. Unlike metformin, treatment with the AMPK activator AICAR stimulated FAO but did not prevent glucose oxidation. Taken together, these data suggest that metformin exerts its effect primarily via inhibition of complex I which leads to subsequent AMPK activation in C2C12 myocytes. This provides a mechanistic explanation of metformin's beneficial effect in lowering intramyocellular lipids leading to reduced insulin resistance. Finally, our preliminary results indicate that this mechanism did not operate in primary rat hepatocytes. This suggests that it is likely the insulin sensitization effect of metformin in energy utilization tissue (muscle) is independent of its antihyperglycemic effect in energy homeostasis tissue (liver).

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##### T3:PS.04

#### Cannabinoid CB1 receptor alleles, metabolic syndrome and HDL cholesterol in obese-hypertensive patients

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**Introduction:** The endocannabinoid system (ECS) plays an important and not yet fully understood role in peripheral regulation of food intake, obesity, and metabolism. Two single nucleotide polymorphisms (SNP) have been identified in CB1 receptor gene: the 3813 A/G variant in exon 4 (rs12720071) and 5489 A/G (rs2023239) in exon3. We studied a group of obese-hypertensive patients with high cardiovascular risk. The aim for our findings was to evaluate the frequency of a genetic polymorphism of CB1 and to study its correlation with clinical parameters.

**Methods:** We analyzed 280 obese hypertensive patients (age <65 years) excluding diabetics in therapy and 280 unselected subjects coming from the same geographic region, as reference population. Genotyping for CB1 SNPs were performed using PCR-restriction length polymorphism. The metabolic syndrome (MetS) was identified by ATPIII criteria.

**Results:** There was not difference in genotype distribution between obese hypertensive and control populations. No association was found for the 5489A/G variant, whereas the 3813 A/G variant had a significant association with the MetS. Patients with MetS had a higher frequency of ancestral allele (A/A) than obese hypertensive without MetS ( $P=0.033$ ). We calculated that 3813G conferred risk for MetS of 0.4 (95%CI 0.1-0.8). Moreover, the 3813G allele was associated with higher levels of HDL in patients without statin therapy ( $n=201$   $P=0.03$ ).

**Conclusion:** These results suggest a role for the 3813G allele as an endocannabinoid protective factor in obese-hypertensive patients, and may provide indirect evidence to support cannabinoid antagonist treatment strategies in obesity.

## T3:PS.05

**Relation between gene expression change in adipose tissue and insulin sensitivity during energy restriction and weight stabilisation**

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Obesity is associated with the development of low grade inflammation. Adipose tissue produces many pro-inflammatory factors (cytokines, interleukines) potentially involved in the progression of insulin resistance associated with obesity. Each step of a weight loss program is associated with molecular adaptations in adipose tissue, potentially modulating insulin sensitivity (InS) and the inflammatory status by mechanisms which remain poorly understood.

Eight obese women followed 4 weeks of energy restriction (ER) and 6 months of weight stabilization (WS). Gene expression profiling of subcutaneous adipose tissue was performed using pangenomic DNA microarray during ER, WS and the whole dietary intervention (DI). We identified 596, 814 and 568 significantly regulated genes during ER, WS and DI, respectively. Although ER affected transiently genes related to energy metabolism, WS induced a maintained down regulation of genes involved in immunity-related processes and/or encoding secreted proteins. Partial Least Square analysis (PLS) was used to model the relationship between InS improvement and differentially expressed genes within each phase. Approximately 90 genes appeared to contribute to InS variation in each optimal PLS model. It showed the involvement of inflammation-related genes during DI and identified *ALOX5AP*, *S100A8* and *MLXIPL* among the most relevant genes. We validated the correlation between InS improvement and mRNA level change of these genes by RT-qPCR.

This study shows that the changes in adipose tissue gene expression contributing to InS are clearly different between ER and WS/DI. Further investigations are required to identify the targets and the effects on cellular response to insulin of the new candidate genes.

## T3:PS.08

**Effects of a 6-day high fructose diet on insulin sensitivity and liver fat in healthy males with a family history of type 2 diabetes**

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**Introduction:** Both genetic and environmental factors are involved in the pathogenesis of insulin resistance. Amongst environmental factors, there is raising concern regarding fructose consumption as a contributor to metabolic disorders. We therefore assessed the effects of a high fructose diet (HFrD) on hepatic fat and insulin sensitivity (IS) in offspring of patients with type 2 diabetes mellitus (OffT2D), a subgroup of individuals at higher risk for insulin resistance.

**Methods:** Male OffT2D (n=9) and controls (Ctrl, n=5) were studied in a crossover design after either a 6-day control diet or a 6 day HFrD (3.5g/kg fat free mass/day). IS was assessed by a 2-step hyperinsulinemic clamp (0.3 and 1.0 mU/kg/min) to measure liver and muscle IS. Hepatic IS index was calculated as  $[100 - (\text{hepatic glucose production} \times \text{fasting insulin})]$ ; whole-body IS was estimated from the glucose disposal rate. Intrahepatocellular- (IHCL) and intramyocellular lipids (IMCL) were measured by <sup>1</sup>H magnetic resonance spectroscopy.

**Results:** HFrD increased ( $P < 0.05$ ) fasting plasma VLDL-triglycerides (Ctrl: +55%; OffT2D: +148%) and IHCL (Ctrl: +62%; OffT2D: +105%) and decreased ketone bodies (Ctrl: -72%; OffT2D: -61%) in both groups. Magnitude of change in VLDL-TG was greater in the OffT2D ( $P < 0.05$ ). Hepatic IS decreased (Ctrl: -15%,  $P = 0.3$ ; OffT2D: -10%,  $P = 0.01$ ), in association with higher alanine aminotransferase (Ctrl: +73%,  $P = 0.1$ ; OffT2D: +89%,  $P = 0.01$ ). Whole-body IS was lower and IMCL higher in OffT2D at the control condition ( $P < 0.05$ ).

**Conclusions:** HFrD induced substantial hepatic alterations after 6 days. These deleterious effects of fructose were more marked in the OffT2D, meaning that they may be more susceptible to HFrD.

## T3:PS.06

**Weight loss, improvement of metabolic profile and reduction of liver volume in obese women after gastric banding**

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The hepatic left lobe volume (HLLV) has been proposed as an indicator of visceral adiposity, strongly associated with various risk factors of the metabolic syndrome. This longitudinal study was aimed to evaluate the relationship between weight loss, metabolic improvement and the reduction of liver volume in obese women. Swedish Adjustable Gastric Banding (SAGB) was chosen as a model since it produces a sustained weight loss without major alterations of the anatomy and physiology of the gastrointestinal tract. Fifty severely obese women (mean age  $44.5 \pm 11$  yr; mean BMI  $43 \pm 5$  Kg/m<sup>2</sup>) were enrolled. The postoperative follow-up was  $22 \pm 7$  months. Abdominal ultrasound was performed for determination of HLLV, subcutaneous and visceral adipose tissue thickness. Reduction of various anthropometric parameters was, on average, -22.5 % for BMI, -13.3 % for subcutaneous adipose tissue, -41.6 % for visceral adipose tissue and -43.6 % for HLLV. Reduction of HLLV was independently related to reduction of both BMI and visceral adipose tissue. Reduction of liver enzymes, serum glucose, insulin and triglycerides was independently related only to reduction of HLLV. Reduction of serum uric acid was independently related only to reduction of visceral adipose tissue. In conclusion, weight loss obtained by SAGB is associated with a marked reduction of liver volume. Ultrasound measurement of HLLV is confirmed as a reliable, simple and low-cost tool for the estimation of visceral adiposity in obese women.

## T3:PS.09

**Exercise of low energy expenditure along with mild calorie restriction acutely reduces postprandial triacylglycerolemia in young women**

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A single bout of prolonged, moderate-intensity exercise lowers fasting and postprandial triacylglycerol (TAG) concentrations the next day. However, the TAG-lowering effect of exercise is dose-dependent and does not manifest after light exercise of low energy cost (<2 MJ). We aimed to investigate whether superimposing mild calorie intake restriction to such exercise potentiates the hypotriacylglycerolemic effect. Eight healthy, sedentary, premenopausal women (age:  $27.1 \pm 1.3$  years, body mass index:  $21.8 \pm 0.9$  kg/m<sup>2</sup>) performed two oral fat tolerance tests in the morning on two different occasions: once after a single bout of light exercise (100 min at 30% of peak oxygen consumption, net energy expenditure:  $1.04 \pm 0.01$  MJ) coupled with mild calorie restriction ( $1.39 \pm 0.22$  MJ) on the preceding day, and once after resting coupled with isocaloric feeding on the preceding day (control). Fasting plasma TAG, TRL-TAG and serum insulin concentrations were 18%, 34% and 30% lower, respectively, after exercise plus diet compared with the control trial ( $P < 0.05$ ). Postprandial concentrations of plasma TAG and TRL-TAG were 19% and 27% lower after exercise plus diet compared with the control condition ( $P < 0.01$ ), whereas postprandial insulin concentrations were not different. It is concluded that a combination of light exercise along with mild hypocaloric diet comprises a practical and feasible intervention to attenuate fasting and postprandial triacylglycerolemia, especially for people who cannot exercise for prolonged periods of time at moderate-to-high intensities, such as many sedentary or obese individuals.

Research relating to this abstract was funded by the Greek Governmental Institute of Scholarships.

## T3:PS.10

**Metabolic syndrome is not associated to arterial dysfunction in obese children.**Mimoun E<sup>1</sup>, Aggoun Y<sup>2</sup>, Pousset M<sup>3</sup>, Dubern B<sup>1</sup>, Girardet J-P<sup>1</sup>, Bonnet D<sup>2</sup>, Patrick T<sup>1</sup><sup>1</sup>Pediatric gastroenterology and nutrition, Armand-Trousseau Hospital, Paris, France<sup>2</sup>Paediatric cardiology, Necker Enfants-Malades hospital, Paris, France<sup>3</sup>INSERM U669, Maison des Adolescents, Cochin hospital, Paris, France**Aim:** To determine whether metabolic syndrome was associated with arterial alterations in obese children.**Methods:** 161 obese children aged  $11.7 \pm 0.2$  years were studied. Metabolic syndrome was defined in three different ways, two commonly used and one personal. Non-invasive ultrasonic measurements were performed to evaluate intima-media thickness (IMT), cross-sectional compliance (CSC) and distensibility, and incremental elastic modulus at the common carotid artery level. Endothelial function was assessed at the brachial artery level by flow-mediated and glyceryltrinitrate-mediated dilation measurements.**Results:** The prevalence of metabolic syndrome was 11.2%, 11.8% and 16.8% according to the three different definitions used. IMT was positively correlated to LDL-cholesterol ( $r=0.21$ ,  $p<0.01$ ) and negatively correlated to HDL-cholesterol ( $r=-0.17$ ,  $p<0.05$ ). In adolescents (11-18 years), CSC was negatively correlated with abdominal fat ( $r=-0.22$ ,  $p=0.02$ ). We found no significant difference in vascular variables between patients with and without metabolic syndrome, with any of the three definitions used. The only synergistic effects between individual metabolic-syndrome components was an effect of insulinaemia and systolic blood pressure on CSC (4.05;  $p<0.05$ ).**Conclusion:** Metabolic syndrome in obese children was not statistically related to arterial dysfunction, whereas several of its individual components were associated with vascular alterations. These data suggest that the metabolic syndrome concept may not be helpful in managing cardiovascular risk in obese children. Instead, risk factors should be evaluated and controlled individually.

## T3:PS.12

**Reduced glycemic and insulinemic responses following trehalose and isomaltulose ingestion: implications for postprandial substrate use**Van Can, JGP<sup>1</sup>, IJzerman, TH<sup>1</sup>, van Loon, LJC<sup>1,2</sup>, Brouns, F<sup>3</sup>, Blaak, EE<sup>1</sup>.<sup>1</sup>Department of Human Biology, Nutrition and Toxicology Research Institute Maastricht (NUTRIM), Maastricht University, Maastricht, The Netherlands<sup>2</sup>Department of Movement Sciences, NUTRIM, Maastricht University, Maastricht, The Netherlands<sup>3</sup>Cargill R&D Center, Vilvoorde, BelgiumThe aim of the present study was to compare the postprandial metabolic response to the ingestion of glucose (GLUC) vs. trehalose (TRE) and sucrose (SUC) vs. isomaltulose (IMU). We hypothesized that the reduced rate of digestion and absorption of TRE and IMU will induce lower glycemic and insulinemic responses, leading to higher postprandial fat use when compared to GLUC and SUC, respectively. In a randomized, cross-over study, 10 overweight subjects (age= $31 \pm 4$  y, BMI= $27.7 \pm 0.8$  kg/m<sup>2</sup>) were given 4 different carbohydrate drinks following an overnight fast (AM) and in combination with a subsequent standardized meal (PM). Blood and expired breath samples were taken before ingestion and then every 30 min, substrate use was measured by indirect calorimetry.Ingestion of carbohydrates in combination with a mixed meal resulted in both a lower peak glycemic response as well as  $\Delta$ AUC of TRE vs. GLUC and of IMU vs. SUC. Significant differences in peak insulinemic response and  $\Delta$ AUC were observed with TRE vs. GLUC and IMU vs. SUC during PM. Additionally, postprandial fat oxidation was higher with IMU as compared to SUC when ingested with a mixed meal ( $\Delta$ AUC/min  $-0.003 \pm 0.006$  g vs.  $\Delta$ AUC/min  $-0.02 \pm 0.007$  g). Ghrelin response was significantly reduced after ingestion of IMU compared to SUC during AM. In conclusion, the lower glycemic and insulinemic responses with IMU (combined with a mixed meal) stimulate postprandial fat use, and may represent an effective strategy to support weight loss by promoting a negative fat and energy balance.

## T3:PS.11

**Does sexual dimorphism in fat cell size and number contribute to the sex differences in metabolic disease risk?**

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6400 Perkins Rd, Baton Rouge, La 70808, USA**Introduction:** Women have more body fat than men. However, this is not associated with increased metabolic disease risk. We hypothesized that adipocyte size sub-distribution and number will help us understand this apparent paradox.**Methods:** Subcutaneous adipose tissue biopsies were obtained from obese women [N=141] and men [N=51] matched for BMI [ $31.7 \pm 3.2$  vs.  $30.9 \pm 2.9$  kg/m<sup>2</sup>]. Adipocyte size was measured by osmium fixation, dissociation with urea and counting/sizing on a Coulter counter, followed by a novel statistical analysis to identify sub-distribution of adipocyte size [Smith SR, Adipocytes 2006]. Four major adipocyte sub-distributions were identified: very large, large, medium and small adipocytes.

Total abdominal subcutaneous number=subcutaneous adipose tissue mass [multislice CT] / mean adipocyte size.

**Results:** Women had greater adipocyte number as well as bigger large adipocytes as compared to men. BMI was positively correlated with very-large adipocyte size in women [R=0.25]. In men, BMI was correlated with total abdominal subcutaneous adipocyte number [R=0.62]. The best correlate of insulin resistance [HOMA] was mean adipocyte size in both women and men [R=0.38 and R=0.56, respectively]. HOMA variation was explained by mean adipocyte size and adipocyte number in the women [R<sup>2</sup>=17], and by mean adipocyte size, visceral adipose tissue mass, age and percent small adipocytes in men [R<sup>2</sup>=47].**Discussion:** Women increase fat mass by adipocyte hypertrophy. Men increase fat mass by hyperplasia, perhaps to compensate for the lower number of adipocytes in abdominal subcutaneous adipose depot. These adaptation features might explain the paradox of decreased metabolic risk despite increased fat mass in women.

## T3:PS.13

**Changes of Visceral Fat are Allometrically Related to Total Body Fat Independently of Gender or Weight Loss Intervention**Hall, KD<sup>1</sup>, Hallgreen CE<sup>2</sup><sup>1</sup>National Institutes of Health, Bethesda, U.S.A.<sup>2</sup>Technical University of Denmark, Copenhagen, DenmarkFat accumulation in the visceral adipose tissue (VAT) is believed to be particularly dangerous because it is highly correlated with cardiovascular and metabolic risk factors. We investigated whether or not some weight loss interventions are better than others at targeting the reduction of VAT. We hypothesized that changes of VAT are allometrically related to changes of total fat mass (FM), regardless of the type of intervention, as defined by the differential equation  $dVAT/dFM = k$  VAT/FM where  $k$  is a dimensionless constant. We performed a systematic search of the published literature for weight loss studies that measured FM changes along with VAT changes via MRI or CT imaging. 37 studies satisfied our search criteria, representing 1407 men and women using a variety of weight loss interventions. The allometric equation accurately modeled the data with  $k=1.3 \pm 0.1$  and the model had an  $R^2=0.73$ . The same equation applied for both genders as well as a wide variety of weight loss interventions including bariatric surgery, caloric restriction with or without exercise, and exercise alone. We conclude that changes of VAT are primarily determined by FM changes as well as the initial VAT to FM ratio.

This work was supported by the Intramural Research Program of the NIH, NIDDK.

## T3:PS.14

## New insights into control of blood glucose using the disposition model: a longitudinal analysis

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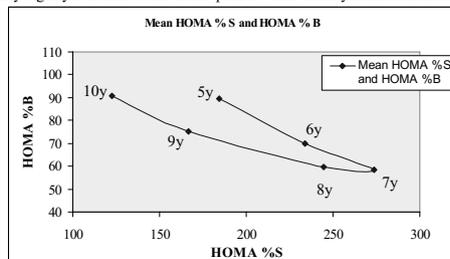
**Introduction:** The hyperbolic relationship between insulin sensitivity (%S) and insulin secretion (%B) defines the behaviour of the glucose-insulin feedback loop, and underpins the HOMA model. Disposition models (dynamic plots of %B against %S) rise new insights into the impact of BMI on glucose control over time.

**Aim:** To map the shifting relationship between insulin sensitivity and insulin secretion in healthy young children as they grow.

**Methods:** Changes in BMI(SD), fasting glucose, %S (1/HOMA-IRx100), %B (HOMA-%B) and their product, the disposition index (DI), were monitored annually from 5-10y in 218 children (126 boys) from the EarlyBird cohort. The changing relationship between %B and %S was plotted year-by-year.

**Results:** BMI(SD) did not change significantly from 5-7y (+0.02SD, p=0.4) but rose from 7-10y (+0.17SD, p<0.001). Glucose rose (4.3-4.8mmol/l, p<0.001) throughout the 5y period, and the DI fell (186.3-115.6, p<0.001), suggesting progressive weakening of loop control. From 5-7y, the fall in DI was attributable to loss of %B, with some compensatory rise in %S (see graph). Around 7y, %S ceased to rise further, the trajectory reversed, and the continuing fall in DI became attributable to falling %S (rising insulin resistance).

**Conclusion:** A disposition map for healthy children, with its switch in direction around 7y, has not been shown before. The trajectory is clear and may reflect the gain in BMI that precedes puberty. Its inflexion may signify a crucial event on the path towards obesity-related morbidities.



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## T3:PS.16

## The relationship between cardiovascular risk factors and body fat with anthropometric parameters in children in cross-sectional and longitudinal analysis

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**Background:** In adults, central obesity predicts cardiovascular risk better as compared to BMI, but in children, cross-sectional studies are controversial and longitudinal data are lacking. We investigated two questions: Is BMI inferior to other anthropometric measures regarding its association to CVRF and body fat? Do changes in anthropometric measures correlate to changes in CVRF and does the inclusion of baseline anthropometric measures in the prediction model improve this relationship?

**Methods:** We examined a randomly selected population-based sample of 502 1<sup>st</sup> and 5<sup>th</sup> grade Swiss schoolchildren in a cross-sectional design and then followed 205 children (randomly selected control group) for 10 months. Outcome measures included hs-CRP, sex hormone binding globulin (SHBG) and fasting insulin concentrations, HOMA-IR and blood pressure, a metabolic risk score and percent body fat (%bf; done by DXA). Exposure variables included BMI, waist circumference and the sum of 4 skinfolds (sfs).

**Results:** In cross-sectional analyses, BMI, waist circumference and sfs were significantly correlated to hs-CRP, Insulin, HOMA, SHBG, blood pressure, the metabolic risk score ( $r^2$  10-85%, all p<0.001), after adjusting for age group, sex and pubertal status. No clinically relevant differences between those measures were observed except that the pbf was best predicted by the sfs. Stratifying by sex, pubertal status or weight status (normal weight vs overweight or obese) did not significantly alter these results. Changes in anthropometric measures were associated with most changes in CVRF and % body fat, albeit less strongly. Adding baseline anthropometric measures to these models improved their association with changes in CVRF ( $r^2$  3-37%, mostly p<0.05). In this total models, changes in CVRF were predominantly associated with the model that included baseline and changes of waist circumference.

**Conclusion:** BMI in children is not inferior to other anthropometric measures in its association with CVRF in cross-sectional analyses, but might be inferior to waist circumference in longitudinal analyses. In addition to changes in anthropometric measures, baseline anthropometric measures add to the prediction of change in CVRF. This raises the question, if there exists an entity of "cardiovascular memory".

## T3:PS.15

## Improvement in quality of life in obese patients is independent of weight loss

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Besides weight loss, quality of life (QL) is another measurement of treatment impact. If QL depends only on weight loss could be considered as surrogate and in this case could lose significance. This study investigated the relation between QL score and weight loss. The time of permanence in follow up was considered another variable of interest for QL assessment.

We used the IWQOL (Impact of Weight on Quality of Life) developed in the University of Duke. It has 8 areas, validated by our team.

We included 69 patients, 55 with complete data (44 women and 11men). Age 44.5±9.5 yo, BMI 38±5.8, waist circumference 107.2±13.13 cm and mean follow up using Kaplan-Meier was 7±0.4 months.

Changes in QL and correlation with weight change:

Area	Improvement in QL (IC 95%) (p)	Correlation with weight reduction (p)
Health	5.6 (3.6-7.7) (<0.001)	-0.10 (0.46)
Food enjoyment	2.3 (<0.001) (1.0-3.6)	0.044 (0.75)
Personal	3.7 (<0.001) (2.4-5.0)	-0.072 (0.60)
Labour	1.8 (0.3-3.3) (<0.05)	-0.09 (0.52)
Physical activity	5.8 (<0.001) (3.7-7.9)	0.07 (0.63)
Social	3.2 (<0.001) (1.7-4.6)	-0.052 (0.71)
Sexual	2.4 (<0.001) (1.2-3.6)	0.13 (0.34)
Self-confidence	3.4 (<0.001) (1.9-4.9)	-0.04 (0.78)

Fifty percent of conditioned success weight lost of 5 or 7% using Kaplan-Meier analysis was obtained at 6.3 months.

We concluded obese subjects with BMI >30 improved the QL score independently of BMI decrease and the time of follow up at the clinic.

To obtain at least 50% of conditional success in weight loss patients should be maintained in treatment for more than 6 months.

## T3:PS.17

## Inflammatory aspects of fatty liver disease in severely obese humans

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The inflammatory component of non-alcoholic steatohepatitis (NASH) in obese humans is generally evaluated by conventional histology. A better characterization of the inflammation is needed since the nature of the inflammation may have important implications for NASH progression.

We have characterized the distribution of neutrophils, macrophages/Kupffer cells and activated hepatic stellate cells by immunohistochemical staining of liver sections of 41 severely obese patients, applying antibodies to human neutrophil peptide 1-3 (HNP1-3), myeloperoxidase (MPO), CD68 and alpha-smooth muscle actin. Furthermore, expression of chemokines IL-8 and CXCL1, and macrophage phenotype markers IL-6, IL-1beta, IL-10, CLEC7A and EMR-1 was determined.

According to the Brunt scoring system, 16 patients showed simple steatosis whereas 25 patients had NASH. The number of HNP1-3 expressing neutrophils, CD68-positive macrophages/Kupffer cells and activated stellate cells did not differ between these two groups. In contrast, the number of MPO-expressing cells was much higher in the NASH group (13.0 vs 38.8 cells/area). A significant proportion of the inflammatory cells surrounded lipid laden hepatocytes, resembling the 'crown-like structures' frequently found in obese adipose tissue. Both IL-8 ( $r_s=0.350$ ) and CXCL1 ( $r_s=0.401$ ) expression correlated with HNP1-3 positive cell number, but not with the number of MPO expressing cells. Analysis of macrophage M1 and M2 phenotype markers indicated that both pro- and anti-inflammatory macrophages are present in NASH.

Taken together, our data show that the presence of MPO expressing macrophages/ Kupffer cells is characteristic of the inflammatory lesion in NASH and indicate that there are important similarities between inflammatory processes in the obese liver and obese adipose tissue.

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## T3:PS.18

**Long term weight loss decreases the non-traditional cardiovascular risk factors IL-18, MMP-9, and hs-CRP in obese subjects independent of changes in blood pressure and lipids**

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**Objective:** To investigate the effect of long term (three years) weight loss on serum levels of the non-traditional cardiovascular risk factors such as hs-CRP, adiponectin, interleukin-18 (IL-18), and matrix metalloproteinase-9 (MMP-9). Moreover, to assess the significance of the magnitude of the weight loss and evaluate potential effects of the lipase inhibitor, orlistat, on these parameters.

**Design:** 68 abdominally obese subjects completed eight-weeks of very low-energy diet (VLED~800 kcal/day) followed by three years of randomized treatment with either orlistat or placebo together with life style intervention. Serum levels of these risk factors were measured by flowmetric xMAP technology.

**Results:** Changes in the levels of IL-18, MMP-9, hs-CRP, and adiponectin were similar in the orlistat and the placebo group during this study. Thus, the two groups were combined for further analysis. A weight loss of  $8.4 \pm 8.8$  kg from baseline to three years was associated with significant decreases in IL-18, MMP-9, hs-CRP ( $p < 0.001$ ) and an increase in adiponectin ( $P < 0.001$ ). MMP-9 was, however, significantly increased after 8 weeks of VLED-induced weight loss ( $p < 0.05$ ). The long term changes in IL-18 were significantly associated with changes in BMI independent of changes in blood pressure and lipids. Levels and changes of these risk factors were significantly associated with each other.

**Conclusion:** Diet induced long term weight loss decreased IL-18, MMP-9, hs-CRP and increased adiponectin. The decrease in IL-18 was associated with changes in BMI independent of changes in blood pressure and lipids, indicating that even a minor weight reduction ( $>7\%$ ) maintained for up to 3 years has beneficial effects on non-traditional cardiovascular risk markers. Orlistat treatment had no independent effects on these inflammatory markers in the present study.

## T3:PS.20

**Cell biology aspects of alström syndrome, a monogenic model of metabolic syndrome.**Zulato, E<sup>1</sup>, Milan, G<sup>1</sup>, Romano, S<sup>1</sup>, Veronese, C<sup>1</sup>, Centobene, C<sup>1</sup>, Urbanet, R<sup>1</sup>, Granzotto, M<sup>1</sup>, Favaretto, F<sup>1</sup>, Maffei, P<sup>1</sup>, Vettor, R<sup>1</sup><sup>1</sup>Endocrine – metabolic Laboratory, Department of Medical and Surgical Sciences, University of Padua, Italy

**Introduction:** Alström Syndrome (ALMS) is a rare, autosomal monogenetic disease, caused by mutation in *ALMS1* (Chr 2p13), a new gene ubiquitously expressed of unknown function.

ALMS is characterized by severe impairments of multiple organ systems, resulting in blindness, hearing impairment, interstitial fibrosis, childhood-onset obesity, hyperinsulinemia, insulin resistance and type 2 diabetes.

**Aim:** we aimed to study some pathophysiological aspects of ALMS which recapitulates most of the features of the metabolic syndrome.

**Research design and methods:** we investigated in primary fibroblast cultures from ALMS patients: 1) the insulin sensitivity assayed by insulin-dependent 2-<sup>3</sup>H-Deoxy-D-Glucose uptake; 2) the gene expression profile by cDNA microarray analysis and real-time PCR; 3) their ability to differentiate into adipocytes under adipogenic conditions. Lipid accumulation was assessed by oil red O staining and morphological changes by microscopy. Moreover we studied the changes in *Alms1* gene expression during adipogenic differentiation of 3T3-L1 fibroblasts.

**Results and conclusions:** we did not observe any variation in insulin sensitivity between ALMS and control fibroblasts. Comparative analysis between the differential gene expression profiles of ALMS and control showed a significant increase in *INSR* without any difference in *GLUT4*. 11 genes coding for different types of collagen resulted up-regulated suggesting an involvement of *ALMS1* in the multi-organ fibrosis. The adipogenic potential of ALMS fibroblasts was clearly increased compared with controls. A downregulation of *Alms1* was observed during the 3T3-L1 differentiation, suggesting that *Alms1* could have an influence in the early phase of adipogenesis thus partially explaining the propensity of ALMS patients to obesity.

## T3:PS.19

**The relationship of liver tests with the components of the metabolic syndrome in overweighted and obese women.**

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**Aims:** To investigate whether liver tests [AST, ALT, alkaline phosphatase (ALP), GGT] are increased in subjects with the metabolic syndrome (MS) as defined by the National Cholesterol Education Program-Adult Treatment Panel III (NCEP-ATPIII).

**Methods and Results:** Waist circumference, blood pressure, fasting glucose, triglycerides, HDL cholesterol, and liver tests (AST, ALT, ALP and GGT) were assessed in overweighted and obese women (n=447). According to the NCEP-ATP III criteria 25.3% of the subjects was diagnosed as having the ms. In 51.3% of the subjects with the MS, one or more of the liver tests were above the upper limit of normal. Comparing subjects with and without the ms, we found significant differences for ALT ( $37 \pm 22$  U/l vs  $33 \pm 32$  U/l,  $p = 0.007$ ), ALP ( $78 \pm 19$  U/l vs  $75 \pm 26$  U/l,  $p = 0.026$ ) and GGT ( $34 \pm 22$  U/l vs  $29 \pm 32$  U/l,  $p < 0.001$ ). For AST we observed a trend ( $25 \pm 11$  U/l vs  $24 \pm 14$  U/l,  $p = 0.070$ ). Differences in ALT and GGT remained significant even after adjusting for BMI, ferritin and CRP. When subjects were classified according to the number of components of the MS, levels of ALT, GGT, ferritin and CRP significantly increased with the number of components present ( $p < 0.05$ ). Stepwise multiple regression analysis, with the components of the MS as independent variables and liver tests as dependent variables, showed mainly fasting glucose and triglycerides as the most important determinants of liver markers.

**Conclusions:** Increasing features of the MS are associated with increased prevalence of disturbed liver tests and inflammation suggesting a causal link between the MS and NAFLD.

This work is part of the project "Hepatic and adipose tissue and functions in the metabolic syndrome" (HEPADIP), which is supported by the European Commission as an Integrated Project under the 6th Framework Programme (Contract LSHM-CT-2005-018734).

## T3:PS.21

**Metabolic inflexibility in response to short-term high-fat overfeeding may play an integral role in the development of metabolic disorders in young men with low birth weight.**Astrup, A<sup>2</sup>, Brøns, C<sup>1,2</sup>, Lilleore, SK<sup>1,2</sup>, Jensen, CB<sup>1</sup>, Storgaard, H<sup>1</sup>, Toubro, S<sup>2</sup> and Vaag, A<sup>1</sup><sup>1</sup>Steno Diabetes Center, Niels Steensens Vej 2, 2820 Gentofte, Denmark<sup>2</sup>Department of Human Nutrition, Faculty of Life Sciences, University of Copenhagen, Rolighedsvej 30, 1958 Frederiksberg C, Denmark

**Objective:** Low birth weight (LBW) is a risk factor for insulin resistance and development of type 2 diabetes. An impaired capacity to increase fat oxidation according to dietary fat intake and/or a reduced diet-induced thermogenic response could represent a link between LBW and future risk of metabolic disorders. We hypothesized that short-term, high-fat overfeeding might unmask defects of energy metabolism in young men with LBW.

**Methods:** Forty-six healthy men matched for age and BMI were included in the study. Twenty subjects had LBW and 26 were normal birth weight (NBW) controls. Subjects were fed a high-fat diet (HFD) with 50% extra calories for 4 days. 24-h energy expenditure (EE), respiratory quotient (RQ) and substrate oxidation rates were assessed using respiratory chambers.

**Results:** The LBW group exhibited lower adjusted RQ during nighttime compared to controls ( $0.81 \pm 0.01$  vs.  $0.83 \pm 0.01$ ,  $P = 0.02$ ), while EE was similar between groups. As a consequence, the relative contribution of glucose and fat oxidation to EE was shifted in LBW group with higher adjusted fat oxidation ( $3.12 \pm 0.1$  kJ/min vs.  $2.75 \pm 0.08$  kJ/min,  $P = 0.01$ ). Additionally, LBW subjects exhibited an increased diet-induced thermogenesis and a tendency towards increased postprandial fat oxidation.

**Conclusion:** These observations imply that obesity associated with LBW is not mediated by an impaired capacity for fat oxidation. We also uncovered evidence for metabolic inflexibility in LBW subjects, as food intake failed to induce a switch in substrate utilization from fat to glucose. Taken together, this may play an integral role in the development of insulin resistance and type 2 diabetes in LBW subjects.

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## T3:PS.22

**The effect of the four types of dietary intervention on the proatherogenic LDL subclass profile, and the blood oxidative stress parameters. The LIPGENE study.**

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Identification of the most appropriate dietary approach for the treatment of the atherogenic dyslipidemia remains still under investigation. Recently small, dense low-density lipoprotein (sd-LDL B) has been highlighted as a risk factor for CHD. Atherogenic sd-LDL B are connected with obesity, insulin resistance and hypertriglyceridemia, suggesting importance of these particles in complications of metabolic syndrome. The analysis was done on the subgroup of the EU F6 LIPGENE Human Dietary Intervention Study. Patients with the metabolic syndrome (n=99) received one of four dietary regime: (A) High-fat (38% energy) SFA-rich diet; (B) High-fat (38% energy), MUFA-rich diet; (C) Isocaloric low-fat (LF) (28% energy), high-complex carbohydrate diet with supplement 1.24g/d high oleic sunflower oil and (D) Isocaloric low-fat (28% energy), high-complex carbohydrate diet, supplemented with 1.24 g/d LC n-3 PUFA for 12 weeks. LDL subclass profiles as well as indicators of plasma oxidative stress and antioxidant potency were determined in pre- and post-intervention fasting state. No significant influence on the overall blood lipid level was found. However dietary fat modification caused by the LF n-3 PUFA (D) and MUFA-rich diet (B), resulted in favorable alteration of LDL phenotype (from B to A), accompanied by diminished oxidative stress and improved antioxidant potency, demonstrating the efficacy of dietary intervention in modification of proatherogenic risk factors in the course of metabolic syndrome without distinct effect on the main plasma lipid concentrations.

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## T3:PS.24

**Impact of abdominal and peripheral fat mass measured with dual-energy-x-ray-absorptiometry (dxa) on cardio-metabolic risk factors (cr)**

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**Aim:** Overweight associated metabolic risk shows inter-individual differences, that are not explained by total fat mass (FM) alone. The objective was a differentiated analyses of the association of various body fat compartments and cardio-metabolic risk-factors (CR). In addition, the value of Dual-Energy-X-Ray-Absorptiometry (DXA)-segmentation was compared with Magnetic-Resonance-Imaging (MRI).

**Methods:** 212 healthy subjects (f:108, m:104, age:43.2±15.4y, BMI: f:25.2±5.1kg/m<sup>2</sup>, m:26.6±3.8 kg/m<sup>2</sup>) underwent a whole-body DXA-scan (manual segmentation: arms, legs, abdomen). In 149 subjects visceral fat (vcFM<sub>MRI</sub>) was analyzed by MRI at L4-L5 and abdominal fat by DXA-segmentation. CR (mean arterial blood pressure (MAP), cholesterol, triglycerides (TG), HDL-C, LDL-C, glucose- and insulin-levels (calculation of insulin-resistance by HOMA-Index)) were assessed.

**Results:** Women had significantly higher proportions of leg-FM<sub>DXA</sub>/total-FM<sub>DXA</sub> (f:41%, m:32%), whereas men showed significantly higher proportions of abdomen-FM<sub>DXA</sub>/total-FM<sub>DXA</sub> (m:46%, f:40). Partial correlations adjusted for age, sex and %FM<sub>DXA</sub> revealed significant, positive relationships (negative association for HDL-C) between abdomen-FM<sub>DXA</sub>/total-FM<sub>DXA</sub> and CR (r=-0.26(HDL-C), r=0.20(LDL-C), r=0.21(MAP), r=0.24(insulin), r=0.24(HOMA), p<0.01), but inverse associations between leg-FM<sub>DXA</sub>/total-FM<sub>DXA</sub> and CR (r=0.26(HDL-C), r=-0.22(LDL-C), r=-0.22(insulin), r=-0.23(HOMA), r=-0.18(MAP), p<0.01). In a partial correlation adjusted for abdomen-FM<sub>DXA</sub>/total-FM<sub>DXA</sub> the inverse associations between leg-FM<sub>DXA</sub>/total-FM<sub>DXA</sub> and CR remained significant. There were significant and positive associations between different methods to assess abdominal or visceral fat (abdomen-FM<sub>DXA</sub> vs. WC (f:r=0.79, m:r=0.81), WC vs. vcFM<sub>MRI</sub> (f:r=0.73, m:r=0.77) and abdomen-FM<sub>DXA</sub> vs. vcFM<sub>MRI</sub> (f:r=0.61, m:r=0.76)).

**Conclusions:** CR increased with higher ratios of abdomen-FM<sub>DXA</sub>/total-FM<sub>DXA</sub>, whereas greater proportions of leg-FM<sub>DXA</sub>/total-FM<sub>DXA</sub> seem to be protective. These effects remained significant after adjusting for abdomen-FM<sub>DXA</sub>/total-FM<sub>DXA</sub>.

## T3:PS.23

**Visceral fat accumulation causes the atrophy of mesenteric lymph nodes in obese mice fed a high-fat diet**

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Japan, <sup>5</sup>Department of Biological Science and Immunomodulation Research Center, University of Ulsan, Ulsan 680-749, South Korea.

Visceral fat exhibits more enhanced lipolytic activity and inflammatory phenotypes than other fat depots. However, it is unclear whether the vicious phenotypes are associated with immune dysfunction in obesity. Because adipose tissue is anatomically associated with lymph nodes, the secondary lymphoid organ, we hypothesized that visceral fat accumulation influences the cellularity of lymphoid tissue embedded in visceral fat. Mesenteric and inguinal lymph nodes were isolated from obese mice fed a high-fat diet and control mice fed a regular diet. T cell population, activation state, and the extent of apoptosis were determined by flow cytometric analysis or TUNEL assay. The weight of mesenteric lymph nodes of and the number of lymphoid total cells in the obese mice significantly decreased compared with those in the control mice, however, no change was observed in the weight of inguinal lymph nodes. The numbers of CD4+ and CD8+ T cells in the mesenteric lymph nodes of obese mice significantly decreased compared with those of the control. Enhanced T cell activation and apoptosis were observed in the mesenteric lymph node cells of the obese mice. The treatment of lymph node cells with free fatty acids and oxidative stress, which are obesity-related factors, resulted in lymph node T cell activation and apoptosis. These results suggest that visceral fat accumulation can cause the atrophy of mesenteric lymph nodes by enhancing activation-induced T cell apoptosis. Visceral fat accumulation may be crucial for obesity-related immune dysfunction.

## T3:PS.25

**The contribution of organ and tissue masses to interindividual. Resting energy expenditure (ree)-variances: Influence of sex and obesity**

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**Aim:** The study objective was to investigate the contribution of organ- and tissue-masses to inter-individual REE-variances and its influence on sex- and BMI-dependent differences in REE.

**Methods:** The study population consisted of 215 healthy subjects (m:106,f:109, age:43.2±15.4y (18-78y),BMI: m:26.5±3.8kg/m<sup>2</sup>,f:25.2±5.1kg/m<sup>2</sup>). Magnetic-Resonance-Imaging (MRI) was used to assess organ-masses (brain, heart, liver, kidneys, spleen =OM) and visceral fat-mass (vcFMMRI) at L4-L5. Fat-mass (FM), lean body mass (LBM) and muscle-mass (MM) were measured by Dual-Energy-X-Ray-Absorptiometry (DXA). REEm was measured by indirect calorimetry, adjusted for LBM (REEadj) and compared to REEe calculated from organ- and tissue-masses times specific metabolic rates according to Elia, 1992. To explain REE-variance thyroid hormones (T3, T4, TSH) and fasting glucose- and insulin-levels (insulin-resistance by HOMA-Index) were assessed.

**Results:** REEm and REEadj were significantly higher in men when compared with women (REEm:7.47±0.90 vs. 5.95±0.75MJ/d, REEadj:7.98±0.98 vs. 5.45±0.79MJ/d; p<0.01). In both gender normal-weight(nw) subjects had significantly lower REEm than overweight(ow) subjects (m:-0.70MJ/d, f:-0.46MJ/d) and obese(ob) subjects (m:-1.46MJ/d, f:-1.26MJ/d) (p<0.01). Adjusting REE for LBM significant differences between nw and ob subjects remained (m:-0.45MJ/d, f:-0.71MJ/d) (p<0.01). No differences were found for REEm-REEe between gender (m:-51KJ/d vs. f:25KJ/d) or BMI-classes (m: 31KJ/d(nw) vs. -169KJ/d(ow) vs. 29KJ/d(ob); f: 47KJ/d(nw) vs. -62KJ/d(ow) vs. 44KJ/d(ob)). In a multiple regression analysis LBM explained 78% of REEm-variance. OMMRI, MMDXA, FMDXA and vcFMMRI explained 86% of REEm-variance. HOMA-Index and plasma thyroid hormone-levels did not further explain the REEm-variance.

**Conclusion:** The contribution of high metabolic rate organ-masses explains sex-differences as well as obesity induced differences in REE adjusted for LBM.

## T3:PS.26

## Hyperuricemia and Metabolic Syndrome in the Middle Aged in Taiwan'

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**Objectives:** The relationship between serum uric acid levels and cardiovascular risk factors is complex. We examined the association between hyperuricemia and metabolic syndrome amongst apparently healthy Taiwanese aged from forty to sixty-five years.

**Research Design And Methods:** This cross-sectional survey was based on a population from 4 nationwide health screening centers in Taiwan in 2000. A total of 4,466 subjects, aged 40 to 65 years were included. Blood pressure, body mass index (BMI), waist circumference, HDL cholesterol, serum triglycerides, and uric acid levels were measured. Hyperuricemia was defined as a serum uric acid level  $\geq$  or  $>$  7.0 mg/dl (420  $\mu$ mol/L) in men and  $\geq$  or  $>$  6.0 mg/dl (360  $\mu$ mol/L) in women, respectively. Metabolic syndrome was defined using the National Cholesterol Education Panel (NCEP) criteria or modified NCEP criteria (WC  $>$ 90 cm in men and  $>$ 80 cm in women).

**Results:** The prevalence of hyperuricemia was 42.4% in men and 28.7% in women, respectively. The crude odds ratios (ORs) of metabolic syndrome was 2.79 (and 2.68 using the modified NCEP criteria) in subjects with hyperuricemia. With increasing age (OR=1.01-1.10) and BMI (OR=1.39-1.47), the ORs of having metabolic syndrome increased significantly in each gender. After adjustment for age, gender, and BMI, the ORs of metabolic syndrome were significantly higher in subjects with hyperuricemia.

**Conclusions:** The present study revealed that hyperuricemia was positively associated with metabolic syndrome and its individual factors. Therefore, serum uric acid levels may be applied as an additional evaluation for metabolic syndrome in a clinical setting.

**Table 1.** Odds ratios (95% CI) of having MS derived from a multivariate logistic regression analysis categorized by gender using age, BMI, and uric acid groups as independent variables.

Variables	Model 1 (MS defined by NCEP criteria)		Model 2 (MS defined by modified NCEP criteria)	
	Men ORs (95% CI)	Women ORs (95% CI)	Men ORs (95% CI)	Women ORs (95% CI)
Age (years)	1.01(0.98-1.03)	1.09(1.05-1.13)	0.99(0.97-1.01)	1.10(1.06-1.13)
BMI (kg/m <sup>2</sup> )	1.47(1.40-1.53)	1.39(1.32-1.46)	1.42(1.36-1.48)	1.47(1.40-1.55)
UA group	1	1	1	1
Grade 1*	1.50(1.16-1.95)	1.48(1.00-2.20)	1.45(1.15-1.83)	1.22(0.84-1.77)
Grade 2	1.60(1.20-2.14)	2.00(1.17-3.40)	1.61(1.24-2.10)	1.72(1.03-2.86)
Grade 3	1.67(1.14-2.42)	2.48(1.12-5.49)	1.65(1.16-2.35)	2.35(1.10-5.03)
Grade 4	2.28(1.37-3.80)	6.58(2.33-18.60)	2.32(1.39-3.86)	4.24(1.49-12.11)

\*Grade 1 was defined by uric acid level  $\geq$  7-7.99 in men and 6-6.99 in women;

Grade 2 was defined by uric acid level  $\geq$  8-8.99 in men and 7-7.99 in women;

Grade 3 was defined by uric acid level  $\geq$  9-9.99 in men and 8-8.99 in women;

Grade 4 was defined by uric acid level  $\geq$  10 in men and  $\geq$  9 in women

## T3:PS.28

## Fenugreek with reduced bitterness prevents diabetes accompanied with obesity

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Fenugreek (*Trigonella foenum-graecum* L. *Leguminosae*) is one of the oldest medicinal plants, much cultivated in India and Mediterranean countries. It is one of the spices which are contained in curry powder. Fenugreek has various medical effects such as nourishing, lactation stimulant, treatment of indigestion and anti-inflammatory. Recently, hypoglycemic effect of fenugreek on type1 and type2 diabetes was reported. However, its mechanism is still uncertain. And it is difficult to apply fenugreek to foodstuff, because fenugreek has a strong bitter taste.

Furostanol saponins contained in fenugreek are major cause for bitterness. Enzymatic cleavage at the O-linked sugar chain of fenugreek saponins yielded fenugreek with reduced bitterness (FRB). To evaluate the effect of FRB on diabetes and investigate its mechanism, we examined the effects of FRB on the metabolism of glucose and lipid in obese diabetic KK-Ay mice.

Hyperglycemia accompanied with obesity was ameliorated in KK-Ay mice fed with FRB. Glucose tolerance was also improved in mice fed with FRB. This treatment increased the expression of peroxisome proliferator-activated receptor  $\gamma$  (PPAR $\gamma$ ) and PPAR $\gamma$  target genes, while decreased slightly the expression of macrophage-specific genes in white adipose tissue. Moreover, hyperlipidemia and hepatosteatosis were ameliorated in mice fed with FRB. Interestingly, this treatment decreased the expression of sterol regulatory element-binding proteins1c (SREBP1c) and SREBP1c target genes in liver. These results indicate that FRB improves the disorder of glucose and lipid metabolism. Consequently, FRB may be useful for ameliorating diabetes accompanied with obesity.

## T3:PS.27

## Reduction of the cut-off of waist circumference does not seem to modify the prevalence of metabolic syndrome in a population with morbid obesity

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Metabolic syndrome (MS) is described by the presence of abdominal obesity, hyperglycemia, hypertension and dyslipidemia, associated with increased cardiovascular risk. In this study MS prevalence in an obese population was evaluated according to ATP-III-2001, ATP-III-2005 and IDF-2005.

Patients were evaluated in their first morbid obesity appointment, regarding anthropometric variables, blood pressure, fasting plasma levels of glucose, LDL-C, HDL-C and triglycerides.

262 women having 40.9  $\pm$  11.3 years old and 45.4  $\pm$  6.3Kg/m<sup>2</sup> BMI were evaluated. MS was observed in 63.0%, 66.8% and 66.4%, according to ATP-III-2001, ATP-III-2005 and IDF-2005, respectively. Hypertension prevalence was 83.2% (218/262 revealed systolic blood pressure  $\geq$ 130mmHg and/or diastolic blood pressure  $\geq$ 85mmHg, or under therapeutic). 38.9% revealed triglycerides concentration  $\geq$ 150mg/dL, or under therapeutic. Waist circumference was  $>$  88cm in 98.5% and  $>$  80cm in 99.2%. Fasting plasma glucose (FPG) was  $\geq$  110mg/dL in 39.3% and 48.5%  $>$  100mg/dL; 43.9% showed HDL-C  $<$  50mg/dL.

40 men having an age average of 39.6  $\pm$  13.3 years and mean BMI of 44.7 $\pm$ 4.9Kg/m<sup>2</sup> was evaluated. MS condition was observed in 85% according to ATP-III-2001 criteria and 95% to ATP-III-2005 and IDF criteria. All men had a waist circumference  $>$  102cm. There was a high prevalence of hypertension (92.5%) and hypertriglyceridemia (42.5%). FPG was  $\geq$  110mg/dL in 47.5% and  $>$  100mg/dL in 62.5%. 52.5% had HDL-C  $<$  40mg/dL.

This study revealed that MS prevalence in the analyzed samples was high. The reduction of cut-off of waist circumference did not have influence on the prevalence of MS in this sample.

## T3:PS.29

## Ferritin was associated with metabolic syndrome

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**Introduction:** Metabolic syndrome (MS) is associated with insulin resistance (IR), and MS increases the risks of cardiovascular morbidity and mortality. Ferritin was found to be associated with IR in some studies.

**Aim:** To investigate the relationship between ferritin and MS.

**Material and methods:** Tao-Yuan General Hospital conducted the annual physical examination for an electronic factory in 2002. The workers with elevated alanine transaminase were excluded because it was associated with ferritin level. MS was diagnosed as the criteria of ATP-III with the following changes: waist circumference: male  $\geq$  90 cm or female  $\geq$  80 cm and fasting sugar  $\geq$  100 mg/dl.

**Results:** 3380 workers recruited in our analyses with male to female ratio as 65:35. The mean age was 34.1  $\pm$  8.2 years old and the BMI was 23.3  $\pm$  3.5. Fatty liver was found in 28.3%. MS was found in 12.9% of workers. Using logistic regression analyses, we found that fatty liver, more age, BMI, IR and ferritin were associated with MS. If we regarded ferritin as linear data, the odds ratio (OR) to have MS was 1.002 in each unit increase (ng/ml). Using ferritin  $<$  100 as reference, the OR of ferritin between 100-300 was 1.6 (95% C.I. 1.2-2.0), and the OR of ferritin  $>$  300 was 2.7 (95% C.I. 1.8-4.1).

**Conclusion:** Ferritin was associated with MS significantly. Physicians should take care of the older, obese workers with high ferritin level and fatty liver because they carry higher risk to have MS.

## T3:PS.30

**Capsaicin, a spicy component of hot peppers, attenuates obesity-induced inflammatory responses and insulin resistance.**Kang JH<sup>1</sup>, Han IS<sup>2</sup>, Kawada T<sup>3</sup>, Yu R<sup>1</sup><sup>1</sup>Department of Food Science and Nutrition, University of Ulsan, Ulsan 680-749, South Korea, <sup>2</sup>Department of Biological Science, University of Ulsan, Ulsan 680-749, South Korea, <sup>3</sup>Graduate School of Agriculture, Kyoto University, Uji, Kyoto 611-0011, Japan

Adipokines are involved in the obesity-induced chronic inflammatory response that plays a crucial role in the development of obesity-related pathologies such as type II diabetes and atherosclerosis. We here demonstrate that capsaicin, a naturally occurring phytochemical, can suppress obesity-induced inflammation by modulating adipokine release from and macrophage behavior in obese mice adipose tissues. Capsaicin inhibited the expressions of IL-6 and MCP-1 mRNAs and protein release from the adipose tissues and adipocytes of obese mice, whereas it enhanced the expression of the adiponectin gene and protein. The action of capsaicin is associated with NF- $\kappa$ B inactivation and/or PPAR $\gamma$  activation. Moreover, capsaicin suppressed not only macrophage migration induced by the adipose tissue-conditioned medium, but also macrophage activation to release proinflammatory mediators. *In vivo* experiment, dietary supplement of capsaicin significantly decreased the expression levels of MCP-1 and IL-6, and macrophage accumulation and increased the expression of adiponectin in adipose tissue of the obese mice compared with those of the control. Moreover, capsaicin improved the impairment of glucose tolerance in the obese mice. Capsaicin may be a useful phytochemical for attenuating obesity-induced inflammation and obesity-related complications such as insulin resistance.

## T3:PS.32

**Does low grade inflammation influence the relationship between hemostatic and fibrinolytic markers and visceral adipose tissue?**

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**Aims:** To investigate whether the relationships between visceral adipose tissue (VAT) and markers of hemostasis and fibrinolysis are independent of low-grade inflammation.

**Methods and Results:** Fibrinogen, von Willebrand factor antigen (vWF:Ag) plasminogen activator inhibitor-1 (PAI-1) and high-sensitive c-reactive protein (hs-CRP) were determined in a group of 292 non-diabetic overweight and obese women. A CT-scan (L4-L5) was performed to estimate the amount of visceral adipose tissue (VAT). Fibrinogen levels were significantly higher in subjects with high levels of hs-CRP (median value;  $p < 0.001$ ), while differences in vWF:Ag ( $p = 0.058$ ) and PAI-1 activity levels ( $p = 0.088$ ) were borderline significant. After correction for hs-CRP, VAT was not related to fibrinogen levels ( $r = 0.10$ ;  $p > 0.05$ ), while there was a significant relationship with vWF:Ag ( $r = 0.18$ ;  $p < 0.01$ ) and PAI-1 activity levels ( $r = 0.34$ ;  $p < 0.001$ ). In multiple regression analysis, hs-CRP was the only independent determinant of fibrinogen ( $r^2 = 0.19$ ;  $p < 0.001$ ), but did not determine levels of vWF:Ag or PAI-1.

**Conclusion:** In this group of pre- and postmenopausal women, the relationship between VAT and fibrinogen probably is just a marker of the relationship of both factors with inflammation, while the relationship between PAI-1 and VAT is independent of inflammation. Levels of vWF:Ag are only modestly related to inflammation and VAT.

## T3:PS.31

**Is epicardial fat an indicator of central adiposity in overweight children?**Mazur A<sup>1</sup>, Telega G<sup>2</sup>, Malecka-Tendera E<sup>3</sup><sup>1</sup>Medical Faculty University Of Rzeszow; <sup>2</sup>Medical College of Wisconsin USA; <sup>3</sup>Dept Paediatr Endocr&Diabet, Medical University of Silesia, Katowice, Poland

Visceral adipose tissue is recognized as an independent risk factor for metabolic syndrome in adults. Estimation of abdominal obesity by anthropometry is frequently imprecise, particularly in children. The study aim was to estimate whether epicardial fat (EF) measured by transthoracic echography correlates with waist circumference and metabolic syndrome components in overweight children. In 52 overweight children (23M, 29F) in the mean age  $11.6 \pm 2.87$  years and in 61 normal weight healthy children (24M, 37F) in the mean age  $13.4 \pm 2.13$  years, measurements of EF thickness on the right ventricle was obtained by two-dimensional M-mode echocardiogram. In all children weight status was assessed according to IOTF criteria and their waist circumference was measured. Fasting total cholesterol (TCh), HDL-cholesterol (HDL), triglycerides (TG) and insulin (Ins) were measured. LDL-cholesterol (LDL) was calculated and systolic (SBP) and diastolic blood pressure (DPS) were measured in overweight children. In overweight children EF thickness was  $5.52$  mm ( $4.97$ - $6.07$  95%CI) vs  $2.53$  mm ( $2.32$ - $2.74$  95%CI) in non-overweight, the difference being statistically significant ( $p < 0.0001$ ). EF significantly correlated with weight, BMI, BMI z-score and waist circumference ( $p < 0.0001$ ). There was no correlation between EF and TCh, HDL, LDL, TG, Ins, SBP and DPS, in model adjusting for of weight, age and sex.

It is concluded that although epicardial fat in overweight children shows a strong correlation with BMI and waist circumference it does not seem to be independent predictor of metabolic syndrome in this age group.

## T3:PS.33

**Serum levels of aminotransferases and  $\gamma$ -GT in obese patients**Mesquita J.<sup>1</sup>, Souto S.<sup>1</sup>, Oliveira A.<sup>1,2</sup>, Freitas P.<sup>1,2</sup>, Varela A.<sup>1,2</sup>, Correia F.<sup>1,3</sup>, Carvalho D.<sup>1,2</sup>, Medina J.L.<sup>1,2</sup>Department of Endocrinology, São João Hospital, Oporto, Portugal<sup>1</sup>Faculty of Medicine, Oporto University, Oporto, Portugal<sup>2</sup>Faculty of Food and Nutritional Sciences, Oporto University, Oporto, Portugal<sup>3</sup>

**Introduction:** Nonalcoholic fatty liver disease (NAFLD) is a common liver disorder and one of the major causes of chronic liver disease, specially in western world.

**Objectives:** To access if there is an association between the presence of metabolic syndrome (MS) and elevation of either gamma-glutamyltranspeptidase ( $\gamma$ -GT) or aminotransferase levels. To determine whether any hepatic enzyme is independently related to any of the metabolic syndrome (MS) criteria.

**Design and Methods:** A total of 229 obese women were evaluated in their first obesity medical appointment. Anthropometric variables, blood pressure, fasting plasma levels of glucose (Glu), HDL-C, triglycerides (TG), aminotransferases and  $\gamma$ -GT were measured. The presence of MS was based on IDF-2005 criteria.

**Results:** The patients had mean age of  $41 \pm 11$  years and mean BMI of  $45.4 \pm 6.4$  Kg/m<sup>2</sup>. It was found elevation of at least one of the hepatic enzymes in 41.9% of the women: 15.6% had AST > 31U/L, 24.3% had ALT > 31U/L and 33.5% had  $\gamma$ -GT > 32U/L. The prevalence of MS was 79.1%. There was a significant association between MS and elevated ALT and  $\gamma$ -GT levels ( $p < 0.001$ ). ALT was negatively correlated with HDL-C ( $r = -0.14$ ;  $p < 0.05$ ) and positively correlated with TG ( $r = 0.19$ ;  $p < 0.05$ ) and Glu ( $r = 0.20$ ;  $p < 0.05$ ). AST was positively correlated with TG ( $r = 0.13$ ;  $p < 0.05$ ) and waist circumference ( $r = 0.04$ ;  $p < 0.05$ ).  $\gamma$ -GT was positively correlated with TG ( $r = 0.22$ ;  $p < 0.05$ ) and Glu ( $r = 0.13$ ;  $p < 0.05$ ).

**Conclusions:** In this study it was found an association between MS and ALT and  $\gamma$ -GT elevation. It was also found a positive correlation between hepatic enzymes levels and triglyceride levels.

## T3:PS.34

**Requirements for improving metabolic syndrome via weight-loss intervention: An explorative approach for overweight Japanese women**Nakata Y<sup>1,2</sup>, Okura T<sup>1</sup>, Matsuo T<sup>1</sup>, Tanaka K<sup>1</sup><sup>1</sup>Graduate School of Comprehensive Human Sciences, University of Tsukuba, Tsukuba, Japan<sup>2</sup>Tsukuba Critical Path Research and Education Integrated Leading Center (CREIL), University of Tsukuba, Tsukuba, Japan

This study aimed to determine the requirements for improving metabolic syndrome through an explorative approach. A total of 323 Japanese women, 24–67 years of age, were recruited as subjects, and they met the following criteria: (i) a body mass index (BMI) of 25–40 kg/m<sup>2</sup>, and (ii) at least 1 metabolic syndrome component (abdominal obesity, dyslipidaemia, hypertension, or hyperglycaemia, conforming to the Japanese criteria). The subjects participated in a 3-month low-calorie-diet-induced weight-loss program. We examined the requirements for improving the metabolic syndrome by using classification and regression tree (CART) analysis. Of the 323 subjects, 309 who completed the weight-loss program were included in the analyses. The average percentage weight loss was 11.9% ± 4.2%. The CART analyses showed that the percentage change in weight (cutoff: –8%) was the best requirement for improvement in at least 1 metabolic syndrome component (79.6% in the high-weight loss group vs. 44.1% in the low-weight loss group). In the former group, the baseline BMI (cutoff: 25.9 kg/m<sup>2</sup>) was the best requirement for further partition. Similarly, classification trees were generated to determine the requirements for improving abdominal obesity (best requirement: –13% change in weight), hypertension (best requirement: baseline age of 42 years), and hyperglycaemia (best requirement: –13% change in weight); however, no classification trees were generated to determine the requirements for improving metabolic syndrome prevalence and dyslipidaemia. These results suggest that moderate weight loss of 8–13% contributes to improvements in metabolic syndrome components in overweight Japanese women.

## Track 3 Poster Presentations

## T3:PS.36

**Validity of dual energy X-ray absorptiometry for the estimation of MRI-assessed abdominal adiposity in children**Benfield, LL<sup>1</sup>, Peters, DM<sup>2</sup>, Fox, KR<sup>1</sup>, Blake, H<sup>3</sup>, Rogers, I<sup>3</sup>, Grant, C<sup>4</sup>, Ness, A<sup>5</sup><sup>1</sup> Department of Exercise, Nutrition and Health Sciences, University of Bristol, Bristol, UK<sup>2</sup> School of Sport & Exercise Science, University of Worcester, Worcester, UK<sup>3</sup> Department of Social Medicine, University of Bristol, Bristol, UK<sup>4</sup> Somerset Magnetic Resonance Imaging Centre, Bridgwater, UK<sup>5</sup> Department of Oral and Dental Science, University of Bristol, Bristol, UK

The aims were to investigate the association between DXA measures (trunk fat and total body fat) and MRI measured intra-abdominal adipose tissue (IAAT) and subcutaneous abdominal adipose tissue (SAAT) volumes, and cross-validate prediction equations using DXA and anthropometric measures for estimating IAAT and SAAT.

Seventy four boys (age 13.4±0.4yrs) and 96 girls (age 13.5±0.5yrs) were selected from volunteers enrolled in the Avon Longitudinal Study of Parents and Children. MRI was used to assess SAAT and IAAT and DXA measures utilised paediatric software. Height, weight, and waist circumference were measured and stage of sexual maturation was available via self report.

DXA-derived trunk fat was the best predictor for IAAT and explained 78.1% and 67.3% of the variance of IAAT in boys and girls, respectively. DXA tended to underestimate IAAT in children with more MRI determined IAAT and overestimate IAAT in children with less MRI determined IAAT. DXA trunk fat was the best predictor for SAAT in boys (92.2% variance explained) and DXA total body fat was the best predictor for SAAT in girls (79.9% variance explained). In the absence of DXA, BMI could be a good surrogate measure for estimation of SAAT (89.4% variance explained in boys; 74.5% in girls).

DXA regional trunk fat mass is a relatively good proxy measure of IAAT at the group level but not at the individual level. The DXA prediction equations for SAAT should perform reasonably well at both individual and group levels using regional trunk fat in boys and total body fat in girls.

## T3:PS.35

**Reduced expression of aldo-ketoreductase 1c3 (akr1c3) in adipose tissue from obese subjects with the metabolic syndrome**Sjöholm K<sup>1</sup>, Gabriellsson BG<sup>1</sup>, Jernäs M<sup>1</sup>, Gummesson A<sup>1</sup>, Svensson P-A<sup>1</sup><sup>1</sup>Sahlgrenska Center for Cardiovascular and Metabolic Research (CMR), Department of Molecular and Clinical Medicine, the Sahlgrenska Academy, Göteborg University, Göteborg, Sweden

Aldoketoreductase 1C3 (AKR1C3) is a functional prostaglandin F synthase and is a negative modulator for the availability of ligands for the nuclear receptor peroxisome proliferator-activated receptor-gamma (PPARγ) in macrophages. Furthermore, expression of AKR1C3 is known to be associated with adiposity, one of the components of the metabolic syndrome. Hence, the aim of this study was to investigate AKR1C3 expression in relation to the metabolic syndrome. We studied the expression of AKR1C3 in adipose tissue samples from obese subjects with or without metabolic complications, during very low calorie diet-induced weight loss as well as in isolated human adipocytes of different sizes using microarray analysis and real-time PCR. Adipose tissue AKR1C3 expression levels were lower in obese subjects with the metabolic syndrome compared with healthy obese subjects (p<0.05). Adipose tissue mRNA levels of AKR1C3 were reduced during and after diet-induced weight-loss (p<0.001 at all time-points) compared to baseline levels. In addition, gene expression of AKR1C3 correlated to adipose tissue mRNA and serum leptin levels at baseline (p<0.01 and p<0.05, respectively). AKR1C3 was shown to have its main site of expression in subcutaneous adipose tissue compared to 64 other human tissues. Furthermore, large adipocytes display higher expression of AKR1C3 than small adipocytes (1.5-fold, p<0.01). In conclusion, adipose tissue and adipocyte AKR1C3 expression is altered in metabolic disease.

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## T3:PS.37

**Characterization of human adipose tissue macrophages**Boulier, V<sup>1,2</sup>, Zakaroff-Girard, A<sup>1,2</sup>, De Barros, S<sup>1,2</sup>, Maumus, M<sup>1,2</sup>, Sengenès, C<sup>1,2</sup>, Decaunes, P<sup>1,2</sup>, Galitzky, J<sup>1,2</sup>, Bouloumié, A<sup>1,2</sup><sup>1</sup> Institut National de la Santé et de la Recherche Médicale (INSERM), U858, Toulouse, France<sup>2</sup> Université Toulouse III Paul-Sabatier, Institut de Médecine Moléculaire de Rangueil, Equipe n°1 AVENIR, IFR31, Toulouse, France

The stroma-vascular fraction (SVF) of adipose tissue (AT) contains inflammatory cells. Among them, macrophages were shown to be increased with the growth of the fat mass. The present study was undertaken to further characterize the role(s) and phenotype(s) of these macrophages (i) in human subcutaneous AT of lean to overweight patients and (ii) in subcutaneous and visceral ATs of obese patients.

FACS analysis was performed on the SVF using antibodies directed against macrophage cluster of differentiation (CD) markers. AT macrophages (ATMs) were isolated using an immunoselection/depletion approach and real-time RT-PCR analysis was performed.

In subcutaneous AT of lean to overweight individuals, ATMs were mainly composed by CD45+/CD14+/CD206+/CD16- cells and showed a mixed expression of pro-(TNF-α, IL-6, IL-23, MCP-1, IL-8, COX-2) and anti-inflammatory (IL-10, TGF-β, AMAC-1, COX-1) factors. Fat mass enlargement was associated with a decreased expression of IL-8 and COX-2 and an increased expression of LYVE-1, a remodeling marker. Interestingly, ATMs exerted a significant pro-angiogenic effect on the AT-derived endothelial and progenitor cells.

Comparison of ATMs from obese patient subcutaneous and visceral ATs showed no marked differences in the amount of macrophage accumulated in both locations. However, visceral ATMs exhibited higher transcript levels for COX-1, IL-6 and LYVE-1.

These data showed that ATMs exhibit a specific phenotype, characterized by a mixed expression of pro-inflammatory and remodeling factors, together with a pro-angiogenic activity. Extension of the fat mass is associated with modulation of the ATMs number and phenotype. Finally, AT location modulates the phenotype of ATMs and not their number.

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## T3:PS.39

## Serum haptoglobin (Hp) is a marker of visceral obesity.

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A recent theory looks at obesity as a low grade systemic inflammation condition. This view is supported by several lines of evidence including the association of obesity with elevated acute phase reactants. Haptoglobin (Hp) is a glycoprotein involved in the acute phase response to inflammation, and it has been demonstrated to constitute a marker of adiposity in humans.

The aim of this study was to identify the relationship between Hp and various anthropometric measurements and serum parameters in a cohort of obese women.

Eighty morbidly obese women (mean age 41 ± 11, range 20-63 years; mean BMI 42.6 ± 5.4, range 32.6 – 58.8) were enrolled. Each evaluation consisted of clinical and anthropometric measurements. Abdominal sagittal diameter (ASD) and visceral fat thickness (VF) were measured by ultrasound. Fasting blood samples were collected for assay of several metabolic and hormonal parameters.

A negative correlation between Hp and age ( $p < 0.05$ ) was observed; a positive correlation between Hp and weight ( $p < 0.005$ ), hip circumference ( $p < 0.005$ ), ASD ( $p < 0.01$ ), VF ( $p < 0.0058$ ), BMI ( $p < 0.005$ ) was observed. No significant associations were found between Hp and the other anthropometric measurements. In a multivariate regression analysis only age ( $p = 0.001$ ) and VF ( $p < 0.005$ ) were independent determinants of serum Hp. Serum Hp was positively correlated with white-cells ( $p < 0.0005$ ), platelets ( $p < 0.005$ ), log VES ( $p < 0.0001$ ), log C-reactive protein ( $p < 0.0001$ ) and fibrinogen ( $p < 0.0001$ ).

In conclusion, Hp is a marker of visceral obesity and it is associated with an inflamed obese phenotype. Whether Hp plays a role to increase the cardiometabolic risk remains a matter of investigation.

## T3:PS.41

## Serum amyloid a1 genotypes are associated with coronary artery disease

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Obesity and other risk factors included in the definition for the metabolic syndrome are associated with chronic low-grade inflammation, including slightly raised serum levels of the acute phase protein Serum Amyloid A (SAA). Serum levels of SAA are strongly linked to coronary artery disease (CAD) and we therefore hypothesized that genetic variants of SAA1 and the SAA receptor SelenoproteinS (SELS) are of importance in development of CAD.

Two amino acid-substituting SNPs in the SAA1 gene were genotyped using RFLP analysis in a study comprising of 484 well-characterized patients with CAD and 621 healthy controls. In addition, three SNPs in SELS were genotyped in 650 CAD patients and 648 controls using TaqMan genotyping assays.

Preliminary data showed that subjects with SAA1 3010TT are more likely to develop CAD (OR = 2.17, 95% CI 1.36-3.47) and this link was even stronger in men (OR = 2.28, 95% CI 1.36-3.83). A weaker link was found to genotype 2995CC (OR = 1.52, 95% CI 1.04-2.22). The SAA1 C2995T SNP was associated with BMI and WHR in women (nominal p-value < 0.05 and < 0.05, respectively). Two of the SELS genotype variants were associated with triglyceride and HDL levels (rs4965814 SNP: nominal p-value 0.016 and 0.006, respectively; G-105A SNP: nominal p-value 0.010 and 0.005, respectively).

In conclusion, our results indicate that SAA1 genotypes are associated with CAD and that SAA1 and SELS are involved in the regulation of CAD risk factors.

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## T3:PS.40

## Genotype – phenotype of bclI restriction site and n363s polymorphism of glucocorticoid receptor gene in obese women

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Glucocorticoids (GC) are important regulators in a variety of processes such as body composition, metabolism, and immune function. Response to glucocorticoids has in part been attributed to variation in the glucocorticoid receptors (GR) gene. The aim of study was to assess the genotype-phenotype interaction of BclI and N363S polymorphism of GR gene in women with abdominal obesity (AO) in comparison with normal-weight, healthy women (NW). The study was performed on 153 AO aged 19-46 yrs and 84 age-matched NW. We evaluated: body mass index (BMI), parameters of body composition, lipid profiles, HOMA and QICKI, cortisol, GH, IGF-1, acylated ghrelin, leptin and adiponectin serum concentration. BclI and N363S CR polymorphism was assessed by PCR-RSLP.

Genotype distributions, and G and A allele frequency did not differ between study groups. Amongst AO with CC, GC and GG genotypes of BclI we found significant differences in adiponectin serum concentration and adiponectin/BF ratio. Amongst AO women with AA, AG and GG genotypes (N363S) we found differences in QICKI, serum insulin and leptin concentrations. AO women with wild type (for BclI and N363S) showed lower serum leptin levels

In conclusion, our results suggest that G allele donors of BclI and N363S GR polymorphism gene are less prone to control the metabolic disturbances.

## T3:PS.42

## Efficacy of bariatric surgery in the treatment of obesity-related type II Diabetes Mellitus

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**Background:** It is estimated that up to 80% of persons with diabetes mellitus type 2 are overweight. Effective weight control can lead to improvement or even resolution of their diabetes in these subjects. Laparoscopic methods currently used in bariatric surgery represent a suitable option for sustained weight loss in severely obese-diabetic subjects.

**Methods:** In this prospective review, we analysed the change in the diabetic status in 74 obese-diabetic subjects undergoing three different bariatric procedures in a single institution over 12 months. Included subjects had diabetes for at least 6 months. Evidence of stable treatment was required with oral hypoglycaemic agents or insulin for at least 12 months. They were matched with 74 obese non diabetic subjects on the same conditions.

**Results:** Six months after bariatric procedure the 74 diabetes subjects had a mean excess weight loss (EWL) of 37.8%. EWL dropped by 50.3% in 57 (77.0%) subjects after 12 months. In 47 (63.5%) subjects diabetes resolved completely and 25 subjects (33.8%) had significantly improved their diabetes mellitus (compared with HbA1c) after 12 months. The control group exhibited an average EWL of 41.6% at 6 months. EWL reached 53.4% in 57 control subjects after 12 months. Long-term total mortality after gastric bypass surgery was significantly reduced, particularly deaths from diabetes mellitus.

**Conclusion:** Laparoscopic bariatric surgery resulted in significant and sustained weight loss leading to significant improvement of diabetes. This technique may facilitate treatment of diabetes in subjects refractory to oral medication or on insulin.

**Key words:** bariatric surgery, excess weight loss, diabetes mellitus

## T3:PS.43

**Activation of the complement system in the liver of severely obese patients**Slaats, Y<sup>1</sup>, Jans, A<sup>1</sup>, Rensen, S<sup>1</sup>, Buurman, W<sup>1</sup>, Greve, J<sup>1</sup><sup>1</sup>Maastricht University, Maastricht, The Netherlands

Inflammation plays a causal role in several morbidities related to obesity, such as nonalcoholic steatohepatitis (NASH). The complement system is an important component of the innate immune system and could play a role in the pathophysiology of NASH in obesity. Therefore we studied the activation of the complement system in the livers of severely obese patients.

Liver tissue sections of 38 severely obese patients were immunohistochemically stained for the presence and distribution of activated C3 (the central component of the complement system) and for mannose binding lectin (MBL), the initiating factor of the lectin pathway. Deposition of activated C3 was detected in 66% of the patients. Staining patterns varied between patients and between liver regions. Intense staining was frequently observed around lipid laden hepatocytes. A similar staining pattern was observed for MBL. Presence of MBL was detected in 79% of the patients. Colocalization of MBL with C3a was seen in most C3a- positive livers. Staining of complement factors of the classical pathway and the alternative pathway is in progress.

Our results support a role for the complement system in NASH in severe obesity. The observed staining patterns suggest the triggering of the complement system by fat accumulation in the liver.

## T3:PS.45

**Ethnic differences in weight gain during infancy in the Amsterdam Born Children and their Development (ABCD) study.**Vrijkotte, TGM<sup>1</sup>, Van der Wal FM<sup>2</sup>, Gemke RJB<sup>3</sup>, Bonsel GJ<sup>4</sup><sup>1</sup>Department of Social Medicine, Academic Medical Centre, Amsterdam, The Netherlands<sup>2</sup>Department of Epidemiology, Documentation and Health Promotion, Municipal Health Service, Amsterdam, The Netherlands<sup>3</sup>Department of paediatrics, VU medical Centre, Amsterdam, The Netherlands<sup>4</sup>Institute Health Policy & Management, Erasmus Medical Centre, Rotterdam, The Netherlands.

**Objective:** Childhood obesity is more prevalent in certain ethnic groups. Excessive weight gain in early life, also called catch-up growth, is a risk factor for obesity. We studied whether ethnic differences in catch-up growth exist in the Netherlands, and to what extent these differences can be explained by maternal or infant feeding factors.

**Methods:** Growth measurements of 1638 singleton born infants were used to calculate Standard Deviation Scores (SDS) for weight (using age and gender specific Dutch reference curves). Increase of SDS > 0.67 between 1 month and 1 year was defined as catch-up growth. Four main ethnic groups (maternal country of birth) were distinguished: Dutch, Surinamese, Turkish and Moroccan. Results were adjusted for maternal age and height, pre pregnancy BMI, education level, smoking during pregnancy, preterm delivery (gestational age <37 weeks), Small for Gestational Age (SGA; < 10<sup>th</sup> percentile of Dutch reference curve) and infant feeding at birth (bottle vs breast feeding).

**Results:** Catch-up growth was more prevalent in the Surinamese (46.8%), Turkish (50.0%) and Moroccan (49.7%) infants compared to Dutch infants (36.5%). Catch-up growth was significantly related to preterm birth, SGA, maternal education, smoking, parity and infant feeding. After adjustment for these factors, Turkish (OR:2.0;95%CI:1.2-3.2) and Moroccan (OR:2.0;95%CI:1.3-2.9) infants still showed more often catch-up growth compared to Dutch infants.

**Conclusions:** Catch-up growth during first year is more prevalent in Turkish and Moroccan infants. More research is needed to elucidate these differences, but this finding may partly explain the higher prevalence of childhood obesity in these groups.

## T3:PS.44

**Effects of casein-, soy-, whey with or without GMP-, alpha-lactalbumin-, or gelatin with or without added tryptophan- protein breakfasts on energy intake**Veldhorst, M<sup>1,3</sup>, Nieuwenhuizen, A<sup>1,3</sup>, Hochstenbach-Waelen, A<sup>1,3</sup>, Westerterp, K<sup>1,3</sup>, Engelen, M<sup>2</sup>, Brummer, RJ<sup>3</sup>, Deutz, N<sup>2,3</sup>, Westerterp-Plantenga, M<sup>1</sup>,<sup>1</sup>From the Dept. of Human Biology and <sup>2</sup> the Dept. of Surgery of the Nutrition and Toxicology Research Institute Maastricht (NUTRIM) Maastricht University, P.O. Box 616, 6200 MD, Maastricht, The Netherlands, and <sup>3</sup> from the Top Institute Food and Nutrition, P.O. Box 557, 6700 AN Wageningen, The Netherlands

**Background:** Dietary protein seems to play an important role in body weight regulation.

**Objective:** To compare the effects of casein-, soy-, whey with or without glycomacropeptide(GMP)-, alpha-lactalbumin-, or gelatin with or without added tryptophan(TRP) (added to the level present in alpha-lactalbumin)- protein breakfasts in two concentrations on subsequent satiety and energy intake (EI).

**Design:** Twenty-four healthy subjects (mean±SEM BMI:24.8±0.5 kg/m<sup>2</sup>;age:25±2 years) received a subject-specific standardized breakfast (20% of daily energy requirements); a custard with either casein, soy, whey+/-GMP, alpha-lactalbumin, or gelatin+/-TRP as protein source with either 10/55/35(normal) or 25/55/20(high)En% protein/carbohydrate/fat in a randomized, single-blind design. The sensitive time-point for lunch, as determined in advance, was after 180 minutes; subjects were offered an *ad libitum* lunch (Turkish bread with egg salad, 13/41/46 En% protein/carbohydrate/fat). Appetite profile (with Visual Analogue Scale, VAS) and EI were determined.

**Results:** At the level of 10En% and 25En% from protein, EI at lunch was ~20% lower after an alpha-lactalbumin or gelatin+/-TRP breakfast (2.5±0.2 MJ) compared with after a casein, soy, or whey-GMP breakfast (3.2±0.3 MJ) (p<0.05). Appetite ratings at 180 minutes differed 15-25mm (~40%) on a 100mm VAS (p<0.05). Differences in EI were a function of differences in appetite ratings (R<sup>2</sup>=0.4, p<0.001).

**Conclusion:** Different proteins (alpha-lactalbumin, gelatin, and gelatin+TRP) that are 30-50% more satiating than other proteins (casein, soy, whey, and whey-GMP) induce a related 17-24% reduction of subsequent energy intake.

## T3:PS.46

**Association between different measurement sites of waist circumference and visceral adipose tissue**Bosy-Westphal, A<sup>1</sup>, Booke, CA<sup>1</sup>, Later, W<sup>1</sup>, Hitze, B<sup>1</sup>, Kossel, E<sup>2</sup>, Glüer, C-C<sup>2</sup>, Heller, M<sup>2</sup>, Müller, M<sup>1</sup><sup>1</sup>Institute for Nutrition and Food Science, Christian-Albrechts-University Kiel, Germany<sup>2</sup>Department of Diagnostic Radiology, Universitätsklinikum Schleswig-Holstein, Germany

**Background** Waist circumference (WC) is recommended by experts consensus to assess obesity associated cardiometabolic risk. However, there is no standardized measurement, and the use of different anatomic landmarks may influence the value of WC as an index for visceral adipose tissue (VAT).

**Methods** WC was measured at different sites in 101 healthy subjects (50 males, 51 females, age 42.9±16.2yrs) 1) just below the lowest rib (WC1), 2) midpoint between the lowest rib and iliac crest (WC2) and 3) just above iliac crest (WC3). Volume of VAT was assessed by MRI cross-sectional abdominal images from top of the liver to the femur heads.

**Results** Mean values for WC in males and females were 91.4±11.5 and 80.0±10.6cm (WC1), 93.8±12.1 and 84.6±11.9cm (WC2) and 94.3±10.7 and 89.3±10.8cm (WC3, p<0.01 for differences within sex). For WC1,2 and 3 similar age adjusted partial correlations with VAT were seen in men (r=0.83;r=0.83;r=0.82, p<0.001) but higher values were observed for WC1 in women (r=0.82;r=0.74;r=0.76, p<0.001). The prevalence of elevated WC according to NCEP-ATPIII criteria differed between all 3 anatomic sites and was 22%, 30% and 28% in men and 22%, 33% and 47% in women for WC1,2 and 3 respectively.

**Conclusion** At all measurement sites WC showed a close association with VAT. No difference between sites was observed in men whereas in women WC measured just below the lowest rib was the best index for VAT. The use of unique cut-offs for WC at different anatomic sites leads to substantial discrepancies in the classification of metabolic risk.

## T3:PS.47

**Cardiovascular responses to soft drinks in humans – the contribution of caffeine**

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Overconsumption of soft drinks has been linked with the obesity epidemic and is recognized as a major public health concern. The present study was aimed at determining the contribution of caffeine to the cardiovascular load imposed by soft drinks.

In a randomized crossover study, 12 (8 male) healthy volunteers (aged 20-30 years) ingested drinks containing sucrose with either a caffeine or a placebo tablet. The volume (500ml), sucrose concentration (11%) and caffeine content (50mg) were chosen to simulate a standard soft drink. For 30 min before and 2 hours after each drink, we recorded arterial blood pressure (finger plethysmography), heart rate (ECG) and cardiac output (impedance cardiography). Total peripheral resistance (TPR) was calculated as mean blood pressure divided by cardiac output.

Ingesting sucrose+placebo significantly increased heart rate and cardiac output but had no overall effect on blood pressure due to a decrease in TPR. In contrast, ingesting sucrose+caffeine resulted in a gradual increase in mean blood pressure that, after 2 hours, was  $7.3 \pm 1.4$  mmHg above the basal value. The increases in heart rate and cardiac output after ingesting sucrose+caffeine were not significantly different from those in response to the sucrose+placebo drink. However, the average drop in TPR was considerably less ( $-0.40 \pm 0.46$  mmHg/l  $\text{min}^{-1}$ ) after sucrose+caffeine compared with sucrose+placebo ( $-1.25 \pm 0.44$  mmHg/l  $\text{min}^{-1}$ ).

These data suggest that addition of caffeine to a soft drink, even in small amounts, causes a substantial increase in blood pressure. This effect seems to be due to a caffeine-mediated attenuation of the vasodilatory response to sugar ingestion.

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## T3:PS.49

**Non-alcoholic fatty liver disease and cardiovascular risk factors in obese patients**

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Non-alcoholic fatty liver disease (NAFLD) is a new, emerging problem among obese patients.

**Aim:** The aim of our study was to determine the prevalence of NAFLD in obese subjects and to characterize the relationship between NAFLD and insulin resistance and cardiovascular risk factors.

**Methods:** The study was performed in 223 alcohol- and virus-negative obese men and women. Anthropometric parameters, blood pressure, lipid profile, ALT, AST, blood glucose and insulin, HOMA-IR, oral glucose tolerance test and liver ultrasonography were measured in each subject. The metabolic criteria were defined according to the IDF. Plasma adiponectin, leptin, TNF- $\alpha$ , C-reactive protein (CRP) and PAI-1 were measured in subjects with NAFLD and metabolic syndrome (n = 60).

**Results:** The prevalence of NAFLD was 78,5%, 71,4% of them had metabolic syndrome, 84%- insulin resistance, 56,7%- hyperinsulinemia, 47%- hypertriglyceridemia, 46%- decreased HDL- C, 61%- hypertension. The prevalence of increased ALT levels was 41,7%, AST – 22,9%, AST, ALT-22, 9%. Triglycerides, insulin and HOMA were significantly higher in subjects with NAFLD (p<0,001). Increased ALT activity was significantly associated with fasting insulin, HOMA-IR and TNF- $\alpha$ . (p< 0,05). Low adiponectin levels was observed in 44,4% patients, hyperleptinemia-96, 3%, increased CRP-22,2%, increased TNF- $\alpha$ -24%. All patients had high-level PAI-1. Waist circumference, BMI positively correlated with liver steatosis & negatively with adiponectin.

**Conclusion:** The prevalence of NAFLD is high in obese subjects and strongly associated with cardiovascular risk factors.

## T3:PS.48

**Diabetes and smoking modulate the effect of the apolipoprotein E polymorphism on HDL subfractions**

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**Introduction:** We examined the influence of apolipoprotein E (apoE) polymorphism on lipid profile, especially HDL subfractions, in Iranian population and studied the effect of the lifestyle changes in this relation.

**Materials and methods:** We performed a cross-sectional study of 1030 subjects (452 men and 578 women) from the Tehran Lipid and Glucose Study. Triglyceride, cholesterol, FBS, HDL-C levels and its subfractions, apolipoprotein B and apolipoprotein A1 were determined and body mass index and blood pressure were measured. A segment of the mentioned gene was amplified by PCR and the polymorphism revealed by RFLP using HhaI restriction enzyme.

**Results:** Allele frequencies obtained for APOE\*2, APOE\*3, and APOE\*4 were 5.77%, 85.92%, and 8.3%, respectively. The presence of the 2 allele was significantly associated with increased HDL-C levels (E2=  $50 \pm 14$  mg/dl vs. E4 =  $44 \pm 10$  mg/dl for P<0.001), HDL-2 levels (E2=  $19 \pm 9$  mg/dl vs. E4 =  $15 \pm 7$  mg/dl for P<0.001) and HDL-3 levels (E2=  $32 \pm 8$  mg/dl vs. E4 =  $28 \pm 6$  mg/dl for P=0.005). The relations were significant even after adjustment for age; sex but smoking and diabetes status decreased the effect of APO E2 in HDL-C and HDL subfractions.

**Conclusion:** The observed genotype and allele frequencies were similar to those reported for other Caucasians samples. The finding showed that APOE2 increased the level of HDL-C and HDL subfractions. These findings highlight the important effect of variation in this gene on lipid levels.

**Key words:** Apo B, Polymorphism, Frequency, Lipid

## T3:PS.50

**Adipocytokines in course of OGTT in obese children**Fichna, P, Skowronska, B, Majewska, K, Stankiewicz, W  
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**Objectives:** Insulin resistance, impaired glucose tolerance and changed basal levels of adipocytokines are classic for obesity, however, adipocytokines were not described in course of OGTT.

**Methods:** 102 children (31prepubertal, 71 at II-III Tanner's stages; age 12.6 $\pm$ 3.3) were divided by BMI-SDS ranges: 26 normal weight children SDS $\leq$ 1.0; 17 overweight SDS 1.1-2.0; 37 moderately obese 2.1-4.0 and 22 severely obese  $\geq$ 4.1. OGTT with adiponectin (ADQ) and resistin (RES) serum measurements were done in all of them.

**Results:** ADQ ( $\mu\text{g/mL}$ ) decreased significantly between 0' and 120' of OGTT in obese patients only: controls  $10.78 \pm 6.00$  vs.  $7.49 \pm 10.29$ ; overweight  $7.41 \pm 5.91$  vs.  $4.84 \pm 4.03$ , in moderately obese  $7.25 \pm 4.07$  vs.  $3.29 \pm 2.12$  (p<0.0001) and severely obese  $7.48 \pm 4.12$  vs.  $3.11 \pm 1.92$  (p<0.0001). RES ( $\mu\text{g/mL}$ ) had the same downward trend but appeared not significant 0' vs. 120' changes: controls  $9.83 \pm 7.40$  vs.  $4.63 \pm 0.93$ ; overweight  $11.14 \pm 9.56$  vs.  $5.32 \pm 0.61$ ; moderately  $11.96 \pm 12.16$  vs.  $5.53 \pm 2.03$  and severely obese  $14.33 \pm 22.76$  vs.  $6.04 \pm 4.19$ . RES values at 0' correlated to 120' in controls (r+0.884; p<0.004) and in obese children (r+0.699; p<0.036). ADQ:RES ratio was lowered in both obese subgroups at 0':  $0.59 \pm 0.44$  (p<0.007) or  $0.52 \pm 0.43$  (p<0.048) and at 120'  $0.59 \pm 0.43$  (p<0.027) or  $0.49 \pm 0.34$  (p<0.042) if compare to controls:  $1.08 \pm 0.69$ (0') and  $1.68 \pm 1.52$ (120'). There were found ADQ (from p<0.004 to p<0.03) and ADQ:RES (p<0.01) negative correlations at 0' and 120' to body mass, BMI and BMI-SDS.

**Conclusions:** Hyperinsulinemia and/or hyperglycemia in course of OGTT are suspected to be responsible for abrupt fall down of adiponectin and its ratio to resistin in obese children.

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## T3:PS.51

**Long-term high fat diet induces endothelial dysfunction in mice resistance vessels**

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The aim of this work was to characterize changes in vascular function of resistance vessels related to diet-induced obesity (DIO). Four-week old CB57BL/6J male mice were assigned either to a low-fat (LF) (10 kcal % from fat) or to a high-fat (HF) diet (45 kcal % from fat). After 40 weeks on dietary treatment, HF animals weighed 20% more than LF animals ( $p<0.05$ ). Both leptin ( $13.6\pm 2.0$  ng/ml vs  $28.4\pm 6.1$  ng/ml,  $p<0.05$ ) and insulin plasma levels ( $2.1\pm 0.3$  µg/l vs  $5.8\pm 0.6$  µg/l;  $p<0.001$ ) were significantly increased in HF animals. In contrast, plasma adiponectin was reduced in this group ( $9918\pm 359$  ng/ml vs  $7758\pm 415$  ng/ml;  $p<0.001$ ). Reactivity of resistance vessels was characterized by perfusion of the isolated mesenteric bed (flow of 1.5 ml/min). Contractions to KCl (6 to 75 mM) as well as responses to noradrenaline ( $10^{-7}$  to  $10^{-5}$  M) were significantly higher in HF animals. Relaxant response to acetylcholine ( $10^{-9}$ - $10^{-6}$  M) was significantly impaired in HF animals ( $90.7\pm 4.1\%$  vs  $60.1\pm 1.7\%$ ,  $p<0.001$ ). Endothelium-independent relaxations, elicited by sodium nitroprusside, as well as basal release of nitric oxide, determined by the contractile response to L-NAME ( $10^{-4}$  M), were not modified by dietary treatment. However, superoxide anion production, determined by confocal microscopy, was significantly higher in the HF group. These data show that DIO induces alterations in metabolic parameters which might be related to endothelial dysfunction in resistance vessels.

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## T3:PS.53

**Association of two apolipoprotein A-I gene MspI polymorphisms and obesity in an Iranian population: Tehran Lipid and Glucose study**

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**Introduction:** The Apo A1 is one of the genes, which play a role in the regulation of lipid metabolism, especially in obesity. In other studies two MspI polymorphisms in the ApoA-I gene (G-75A [M1] and C83T [M2]) has been shown to be associated with obesity, and in the present study our aim is to determine this association in an Iranian population.

**Materials & Methods:** Subjects were randomly selected from the Tehran Lipid and Glucose Study and classified into 3 in three groups according to their body mass index:  $BMI<25$ ,  $25\leq BMI<30$ ,  $BMI\geq 30$  and finally 227(100 in men and 127 in women). We measured FBS, HDL-C, triglyceride and cholesterol levels and evaluated body mass index and blood pressure for all individuals. A segment of the mentioned gene with PCR was amplified and the polymorphism with RFLP (MspI) revealed.

**Results:** The allele frequency of Apo A1 polymorphism was in the Hardy Weinberg equilibrium. The presence of the M1<sup>-</sup> allele was significantly associated with increased BMI (M1<sup>-</sup> =  $27\pm 4$  Kg/m<sup>2</sup> vs. M1<sup>+</sup> =  $29\pm 5$  Kg/m<sup>2</sup> for  $P=0.003$ ) waist circumference (M1<sup>-</sup> =  $90\pm 12$  cm vs. M1<sup>+</sup> =  $94\pm 12$  cm for  $P=0.041$ ). Also there is a relation between presence of the M2<sup>-</sup> allele and increase of the BMI (M2<sup>-</sup> =  $28\pm 5$  Kg/m<sup>2</sup> vs. M1<sup>+</sup> =  $26\pm 3$  Kg/m<sup>2</sup> for  $P=0.050$ )

**Conclusion:** These results show that there is relation between Apo A1 polymorphism and BMI in this study. This gene may be a good candidate for obesity in Iranian population.

## T3:PS.52

**Adipose tissue as a producer of endothelial cell adhesion molecules in obesity: comparison of different fat depots and the influence of very low calorie diet**

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We tested the hypothesis that adipose tissue significantly contributes to increased levels of proatherogenic endothelial cell adhesion molecules (CAM) in obesity and explored the influence of very low calorie diet (VLCD) on this production. 25 obese females (OB) and 14 lean healthy females (C) underwent blood drawing and subcutaneous (s.c.) and visceral (visc.) adipose tissue sampling during gastric banding and elective cholecystectomy surgery, respectively. In VLCD substudy, 20 obese females underwent blood drawing and s.c. fat biopsy before and after 3 weeks of VLCD (550 kcal/day).

Serum concentrations of insulin, ICAM-1, VCAM-1 and E-selectin were measured using Lincoplex kits, CAM mRNA expression in fat was measured using RT PCR and protein CAM levels in fat were measured using Lincoplex kits and normalized to protein content.

BMI, serum insulin levels, HOMA index, ICAM-1 and E-selectin concentrations of OB were significantly higher relative to C. Serum concentrations of VCAM-1 did not differ. Messenger RNA expression and protein levels of CAM in s.c. fat were not affected by obesity while in visc. fat ICAM and VCAM mRNA expression and its protein levels were significantly increased in OB relative to C. Three weeks of VLCD decreased circulating E-selectin levels while it did not change circulating ICAM and VCAM or its mRNA expression in s.c. fat.

We conclude that obesity increases visceral but not subcutaneous adipose tissue production of CAM. This finding may partially explain the closer relationship of visceral fat accumulation in obesity to cardiovascular complications.

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## T3:PS.54

**Metabolic syndrome in overweight and obese children and adolescents in Italy**

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The prevalence of obesity among Italian children and adolescents has dramatically increased in the last decades. We examined the prevalence of the metabolic syndrome (MS) and its components in a cohort of 195 Italian children and adolescents.

We studied 96 children (6-10 years old), 31 obese, 45 overweight and 20 normal-weight, and 99 adolescents (11-16 years old), 46 obese, 32 overweight, 21 normal-weight. Standardized clinical measurements, blood pressure, fasting plasma glucose, lipids and insulin were determined. Diagnosis of MS was defined according to the following criteria for age and sex (Italian Consensus on Children Obesity, 2005): BMI >97(th) percentile or waist circumference >90(th) percentile, triglyceride levels >95(th) percentile, HDL cholesterol level <5(th) percentile, systolic or diastolic blood pressure >95(th) percentile, plasma fasting glucose >100 mg/dl. Diagnosis of metabolic syndrome was defined by the presence of at least 3 of the previous criteria.

MS prevalence was 19.4% in obese children and 8.9% in overweight children; among adolescents prevalence of MS was 24.3% and 9.3% in obese and overweight respectively.

The most frequent MS components were low HDL levels, high triglyceride levels and high blood pressure. Insulin resistance (HOMA-IR  $\geq 3.16$ ) was found in 32.2% of the obese and in 11.1% of the overweight children; among adolescents this percentage increased up to 65.5% in obese and 37.5% in overweight.

The MS is very common in obese children and adolescents, but is also represented in overweight subjects. These data suggest the importance of an early intervention to prevent overweight, obesity and their metabolic complications.

## T3:PS.55

**Comparative expression of the eight main genes of the renin-angiotensin system (RAS) in human kidney and adipose tissue**

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**Introduction.** The RAS is linked to visceral adiposity and cardiometabolic complications. Differences in expression pattern between subcutaneous and visceral adipose tissue (SAT; VAT) might have functional relevance. The aim of the study was to compare RAS expression in SAT and VAT using kidney as control tissue. The relation between clinical parameters and RAS expression was also studied.

**Methods.** Samples of kidney cortex, medulla, and VAT were obtained from 38 patients undergoing nephrectomy (from 14 of these patients SAT was also sampled). Renin, (pro)renin receptor (PRR), angiotensinogen, ACE1, ACE2, AT1 receptor, AT2 receptor, and aldosterone synthase gene expression was evaluated by Real Time-PCR and normalized with GAPDH gene expression. Anthropometric and metabolic characteristics were evaluated before surgery.

**Results.** Kidney cortex is the main expression site for renin and ACE2. Angiotensinogen was largely expressed in VAT (about 7 folds higher than SAT;  $P=0.002$ ), whereas ACE1 and AT1 were many folds more expressed in adipose tissue (both SAT and VAT) than in kidney. AT2 and PRR had low expression levels both in adipose and renal tissues, whereas, aldosterone synthase didn't result expressed in neither kidney or adipose tissue. VAT mRNA levels of AT1 was higher in normal-weight than in overweight patients ( $P=0.017$ ).

**Discussion.** The results suggest that VAT is an important source of angiotensinogen and angiotensin-II. Moreover, adipose tissue is a main target organ of angiotensin-II. It's possible also to hypothesize an AT1 "down-regulation" due to increased of AngII production in VAT of obese patients.

## T3:PS.57

**Variation in postprandial peptide YY<sub>3-36</sub> and acylated ghrelin concentrations following ingestion of high Carbohydrate, high Fat and high Protein meals in male subjects with metabolic syndrome**

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Many appetite hormones have been suggested to be involved in the pathogenesis of the metabolic syndrome. The purpose of this study was to investigate the postprandial response of peptide YY<sub>3-36</sub> (PYY<sub>3-36</sub>) and acylated ghrelin to varied macronutrient composition in adult males with and without the metabolic syndrome. The International Diabetes Federation criteria of metabolic syndrome were used. Subjects received, on separate occasions, a high carbohydrate (HC), a high protein (HP) and a high fat (HF) meal. PYY<sub>3-36</sub> levels increased, while acylated ghrelin values decreased, following the three meals, in subjects with and without the metabolic syndrome. Even though the HC meal induced a higher acute PYY<sub>3-36</sub> peak, both HC and HF meals tended to maintain a continuously higher than baseline PYY<sub>3-36</sub> response throughout the postprandial period, in metabolic syndrome subjects. In control subjects, HF meal tended to induce an acutely, while HP meal a longer term, higher increase of PYY<sub>3-36</sub> above baseline. Postprandial acylated ghrelin decrease tended to be more pronounced following HC meal as compared to HP and HF meals, both in metabolic syndrome and control subjects. However, at 180min for MS subjects and at 180 and 240min for control ones, HP meal tended to maintain acylated ghrelin levels' change from baseline lower than that following HC and HF meals.

In conclusion, findings suggest that modulating the release of endogenous appetite hormones, such as PYY<sub>3-36</sub> and acylated ghrelin, through alteration of dietary composition could provide a rational treatment for obesity and metabolic syndrome.

Please note that EASO encourages full disclosure of all relevant sources of funding in relation to abstracts submitted to this congress. If you wish to disclose a conflict of interest or any funding, please do so briefly at the foot of this abstract as follows:

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## T3:PS.56

**The relationship between BMI and measurements of obstructive sleep apnoea**

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**Introduction:** Obstructive sleep apnoea (OSA) occurs in both the obese and non-obese. While obesity is a strong risk factor for OSA, its exact contribution to the causation of disease is unclear. We investigated the relationship between measurements of OSA and BMI.

**Methods:** Body Mass index (BMI), Oxygen Desaturation index (ODI), Apnoea-Hypopnoea index (AHI) and Epworth Sleepiness scale (ESS) were collected in all patients referred to the sleep centre with suspected OSA from the August 2006 to August 2007. The majority of patients underwent an inpatient respiratory screening sleep study (Embletta).

**Results:** 478 patients were analysed, of whom 70% were male. The mean BMI was 31.9 kg/m<sup>2</sup> and ranged from 15 to 64.7 kg/m<sup>2</sup>. 69.3% of patients had an AHI of 10 or above, of whom 78.8% were male. Mean BMI of those with an AHI of 10 or above was 32.9 kg/m<sup>2</sup> (95% CI 32.0 to 33.8), compared to 30.0 kg/m<sup>2</sup> (95% CI 28.6 to 31.4) for those with an AHI of below 10. Amongst the whole cohort, mean AHI was 26.6 (95% CI 24.4 – 28.9), and mean ODI was 22.7 (95% CI 20.3 – 25.3). Median ESS was 11 (n = 287; IQR 7 – 15). BMI positively correlated with AHI, ODI and ESS; Kendal's tau-b = 0.277, 0.361 and 0.086 respectively, all  $P < 0.05$ .

**Discussion:** The majority of patients referred for sleep study had obstructive sleep apnoea. ODI correlated better with BMI than AHI, suggesting that body weight may have a more significant pathological contribution to propensity to desaturate, than to the AHI.

## T3:PS.58

**Excess body weight loss 2 years after gastric bypass linked to psychological comorbidities**

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Bariatric surgery is nowadays the recommended treatment for subjects suffering from morbid obesity (or severe obesity with important comorbidities). There is no clear consensus regarding the link between psychological factors, eating behaviour and post-surgery body weight evolution.

**Objective:** To observe the predictive value of psychological state and eating behaviour on body weight loss for obese patients 2 years after a gastric bypass.

**Method:** 43 female patients (BMI: 44.7 ± 0.4 kg/m<sup>2</sup>) who underwent gastric surgery have been psychologically evaluated with the help of questionnaires on depression (BDI-II), anxiety (HAD) and eating behaviour (EDI-II) before the intervention, and at 1 and 2 years.

**Results:** Excess weight loss at 2 years was 32.1 ± 1.1 and body weight remained stable between the first year (81.3 kg ± 1.7) and the second year (79.8 kg ± 1.7). Depression ( $p < .01$ ), anxiety ( $p < .05$ ) and eating behaviour disorder ( $p < .01$ ) improved between 0 and 2 years. There is no correlation between basic psychological factors in basal state and body weight loss at 1 and 2 years after surgery. However, excess body weight loss at 2 years correlate with psychological factors (depression  $r = -.30$ ,  $p < .01$ ; anxiety  $r = -.46$ ,  $p < .01$ ).

In conclusion, psychological factors and eating behaviour disorder do not predict the effective weight loss at 2 years post-surgery. However, these factors improve after weight loss, and maintained body weight is directly linked with the psychological state at 2 years after weight loss.

## T3:PS.59

**Effects of high and normal casein-, soy-, and whey-protein breakfasts on amino acid, satiety, and 'satiety' hormone responses**

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**Background:** Dietary protein seems to play an important role in body weight regulation.

**Objective:** To compare the effects of high or normal casein-, soy-, or whey with or without glycomacropeptide(GMP)- protein breakfasts on amino acid, satiety, and 'satiety' hormone responses.

**Design:** Twenty-five healthy subjects (mean±SEM BMI:23.9±0.3 kg/m<sup>2</sup>;age:22±1 years) received a subject-specific standardized breakfast (20% of daily energy requirements): a custard with either casein, soy, or whey+/-GMP as protein type with either 10/55/35(normal) or 25/55/20(high)En% protein/carbohydrate/fat in a randomized, single-blind design. Appetite profile (Visual Analogue Scale,VAS), plasma glucose, insulin, GLP-1, ghrelin, and amino acid(AA) concentrations were determined for four hours.

**Results:** At 10En%, whey+/-GMP were more satiating than casein or soy (p<0.05), coinciding with higher leucine and lysine responses (p<0.05). This was not underscored by concentrations of glucose, insulin, GLP-1, or ghrelin since differences were not significant. At 25En% however, there were no differences in satiety. Whey+/-GMP triggered the strongest responses with respect to changes in concentrations of GLP-1 (p<0.05) and ghrelin (p<0.05) compared with soy or casein; and insulin (p<0.001) compared with casein.

**Conclusion:** A difference in satiety between different proteins appeared at the normal concentration of protein, namely at 10En% the whey-protein breakfasts were more satiating than the casein- or soy-protein breakfasts, coincided with higher leucine and lysine concentrations but unrelated to changes in hormone concentrations.

A difference in changes in hormone concentrations between different proteins appeared at the concentration of protein of 25En%; the whey-protein breakfasts triggered stronger responses than the casein- or soy-protein breakfasts.

## T3:PS.61

**Expansion of visceral fat was a determinant factor to increase nonalcoholic fatty liver disease prevalence and degree**

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**Background:** Visceral adiposity is the major risk factor for pediatric nonalcoholic fatty liver disease.

**Objective:** Determine the prevalence of nonalcoholic fatty liver disease according to the visceral fat quartile.

**Methods:** 181 obese adolescents including 113 girls (16.58±1.56 years) and 68 boys (16.87±1.62 years) were evaluated. The inclusion criteria were obesity and post-pubertal stage of Tanner. Visceral fat of obese adolescents was distributed in quartiles after ultrasound nonalcoholic fatty liver disease diagnosis.

**Results:** Nonalcoholic fatty liver disease prevalence was 45.30%. It was observed that 62.07% and 76.47% of girls and boys with nonalcoholic fatty liver disease were found in the 4th quartile. In a multivariate logistic analysis it was observed that only visceral fat remained statistically significant, every 1 cm increase in visceral fat was associated with a 1.97 fold (95% CI 1.06–3.66) in boys and 2.08 fold (95% CI 1.38–3.13) in girls increased risk to develop nonalcoholic fatty liver disease. Indeed it was verified a positive correlation between visceral fat, body mass index, insulin levels, homeostasis model assessment insulin resistance index and steatosis degree.

**Conclusions:** Our findings suggested that the expansion of visceral fat was a determinant factor to increase nonalcoholic fatty liver disease prevalence and the visceral fat measured by ultrasound might be a good predictor to identify risk for nonalcoholic fatty liver disease in obese adolescents. It was confirmed by a stronger correlation between visceral fat and body mass index.

## T3:PS.60

**Effect of Fat Mass extent and distribution on cardiovascular and metabolic parameters in a European healthy population**

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**Subjects and Methods:** A cohort of 1240 healthy individuals (636 f) participating into the RISC study were investigated. In these subjects, insulin sensitivity was assessed by an euglycemic, hyperinsulinemic clamp, whereas carotid intima-media thickness (IMT) was echographically evaluated. Plasma levels of Free Fatty Acid (FFA), Total, HDL and LDL cholesterol and insulin were also measured.

The influence of fat distribution was then investigated in women. To do so, the effect of waist and hip circumferences were separately evaluated after adjustment for the Fat Mass.

**Results:** IMT was strongly influenced by age and Systolic Blood Pressure in both sexes. After adjustment for these factors, IMT was still significantly (p<0.0001) higher in obese subjects.

Larger waist circumference was associated to an increase of total (p<0.005) and LDL (p<0.0001) cholesterol as well as of insulinemia (p< 0.02) and to a decrease of HDL cholesterol (p<0.0005). A larger hip circumference was associated to a significantly lower IMT (p<0.03), LDL cholesterol (p<0.03) and FFA (p<0.005) both in basal and during the clamp.

**Conclusions:** In both sexes, carotid IMT is largely influenced by age and Systolic Blood pressure, whereas fat mass extent exerts a significant but modest influence. In females, prevalent visceral or subcutaneous fat distributions exert different and independent metabolic and cardiovascular effects. Therefore, when evaluating risk factors in a normal body weight or moderately obese population, the effect of waist and hip circumference should be evaluated separately and after adjustment for the Fat Mass.

## T3:PS.62

**Body shape history and risk of developing diabetes among women of the e3n cohort**

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**Aims:** Obesity and increases in body weight in adults are considered to be among the most important risk factors for type 2 diabetes (T2D). Low birthweight is also associated with increased rate of T2D. We aimed to examine the association between body shape history from childhood to adulthood and the risk of developing T2D during middle adulthood.

**Methods:** The E3N study is a prospective study of risk factors of breast cancer that included, in 1990, 98 995 women (40-65 y) living in France and followed by questionnaire every 2 years. At baseline, subjects reported their current weight, height and body silhouette, and their body silhouette at 8 years, puberty, 20-25 years and 35-40 years. Birthweight was recorded in the most recent questionnaire. Cases of T2D were ascertained through both self-report and a drug reimbursement database.

**Results:** Of the 85 635 non diabetic at baseline, 2232 developed T2D over the 15 years of follow-up. Low birthweight (OR=1.5[1.3-1.7]) and thinness at 8 years (OR=2.0 [1.7-2.3]) or at puberty (OR=1.8[1.6-2.1]) appeared to be associated with higher risk of developing diabetes, independently of current BMI. Body shape during young adulthood was positively associated with diabetes risk, but this relationship reversed after adjustment for current BMI. Subjects with a high increase in body silhouette between 35-40 years and baseline were more likely to develop diabetes during the follow-up than those who declared stable body shape.

**Conclusion:** Two factors appeared to increase diabetes risk: thinness at early life and adolescence and recent changes in body shape.

## T3:PS.63

**Metabolic Syndrome in Children: Comparison of the recent IDF consensus with an adapted-NCEP definition in 308 overweight and obese French children**Druet Céline<sup>1</sup>, Ong Ken<sup>1</sup>, Levy-Marchal Claire<sup>2</sup><sup>1</sup>MRC Epidemiology Unit, Institute of Metabolic Science, Cambridge, UK; <sup>2</sup>INSERM, U690, Paris, FR-75019, France

**Introduction:** Definitions of the metabolic syndrome (MS) in children are often adapted from adult MS definitions, but with age and sex related centile thresholds for each biochemical component. In 2007 the International Diabetes Federation (IDF) published a new consensus definition of MS in children, largely using the same absolute values as in their adult definition. In a large group of overweight and obese children we compared the prevalence of MS according to the IDF definition and an adapted National Cholesterol Education Program (NCEP) definition.

**Patients and methods:** 308 overweight and obese (IOTF definition) children were included (166 girls and 142 boys) with a median (range) age of 11 (7-17) years and BMI +3.8 (+1.6-+7.5) SDS.

**Results:** Below age 10 yrs, the prevalence of MS according to the adapted NCEP definition was 18.6%; in contrast the IDF does not recognise MS in this age-group. In children aged 10 yrs or older (n=222), the prevalence of MS was lower according to the IDF definition (9.0%, n=20) than the adapted NCEP definition (14.9%, n=33). IDF-MS positive children had significantly higher waist circumference, BMI, triglycerides, fasting insulin and tended to be older than the intermediate severity group of children with MS only according to adapted NCEP (n=17). Children with MS only according to adapted NCEP differed from non-MS children only in systolic blood pressure and HDL-C.

**Conclusion:** The recent IDF MS criterion in children represents a more severe definition than an adapted NCEP definition, and appears to identify a group of children with higher fasting insulin resistance than other overweight and obese children.

## T3:PS.65

**Is obesity driving the high prevalence of hypertension in black south african women?**Schutte AE<sup>1</sup>, Huisman HW<sup>1</sup>, Van Rooyen JM<sup>1</sup>, Schutte R<sup>1</sup>, Malan L<sup>1</sup>, Reimann M<sup>2</sup>, De Ridder JH<sup>2</sup>, Olckers A<sup>3</sup>, Schwarz PEH<sup>2</sup>, Malan NT<sup>4</sup><sup>1</sup>School for Physiology, Nutrition and Consumer Sciences, North West University, Potchefstroom, South Africa<sup>2</sup>Department of Internal Medicine III, Technical University Dresden, Medical Faculty Carl Gustav Carus, Dresden, Germany<sup>3</sup>School for Biokinetics, Recreation and Sport Science, North West University, Potchefstroom, South Africa<sup>4</sup>Centre for Genome Research (CGR), North West University, Potchefstroom, South Africa and DNAbiotech (Pty) Ltd.

Hypertension is highly prevalent in South Africa, resulting in high stroke mortality rates. Since obesity is very common amongst South African women, it is likely that obesity drives the hypertension prevalence. The aims were to determine whether black African women have higher blood pressures (BP) than Caucasian women, and if obesity is related to their cardiovascular risk. Apparently healthy African (N=102) and Caucasian (N=115) women, matched for age and body mass index, were included. Age-adjusted correlations between obesity (representing total body fat, abdominal obesity and peripheral fat) and cardiovascular risk markers (hemodynamic variables, lipids, inflammatory markers, clotting factors, adipokines) were compared between the ethnic groups. Comparisons between low and high BP groups were also made for each ethnic group. The results confirmed that African women had higher BP (p<0.01), with significantly increased vascular resistance. African women also showed unexpected and significantly weaker correlations between obesity measures and cardiovascular risk markers when compared to Caucasian women (specifically systolic BP, vascular resistance, cardiac output, HDL-cholesterol, fibrinogen, plasminogen activator inhibitor-1, leptin, resistin). Interestingly the latter five risk markers were also not significantly different between low and high BP African groups. But African women showed significant correlations of obesity with triglycerides, C-reactive protein and insulin resistance that were comparable to the Caucasian women. In conclusion, though African women have higher BP than Caucasians, their obesity levels are not as strongly related to traditional cardiovascular risks as with Caucasian women. But results suggest a link with the development of diabetes.

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## T3:PS.64

**Prevalence of metabolic syndrome and associated risk factors in Belgian obese adolescents.**Gies, I<sup>1</sup>, Vanbesien, J<sup>1</sup>, Anckaert, E<sup>2</sup>, Mauel, R<sup>1</sup>, De Schepper J<sup>1</sup>.<sup>1</sup>Dept. of Pediatrics, University Hospital Brussels, Brussels, Belgium.<sup>2</sup>Dept. of Clinical Chemistry, University Hospital Brussels, Brussels, Belgium.

We evaluated the prevalence of metabolic syndrome (MS) in obese adolescents (age > 10 year) consulting for overweight at our hospital and looked for associated clinical and biochemical risk factors for atherosclerosis.

106 obese (BMI SD > 2) adolescents, aged between 10 and 16.8 years, were retrieved. Beside standard blood analysis for MS screening, also insulin, LDL cholesterol, fibrinogen, homocysteine and uric acid concentrations were measured in fasting condition. Standardized anthropometry and blood pressure measurements were performed. MS, as defined by the recent IDF criteria for children, was found in 52 (49%) subjects. In all subjects waist circumference was above the 90<sup>th</sup> percentile. Hypertension was present in 35, low HDL cholesterol in 23, hypertriglyceridemia in 19 and abnormal fasting glucose in 3 patients. No significant differences in gender, age, birth weight, gestational diabetes, paternal obesity and acanthosis nigricans were found between subjects with and without MS. Maternal BMI (30.0 ± 5.5 vs 27.6 ± 4.8; p=0.035), fasting insulin (15.2 ± 9.3 vs 11.3 ± 9.8; p=0.035) and uric acid (5.4 ± 1.3 vs 4.8 ± 1.2; p=0.021), was higher in the MS subjects compared to the non MS group. Fibrinogen concentration, LDL cholesterol and homocysteine were comparable between both groups.

In conclusion, half of obese Belgian adolescents have MS by the recent IDF criteria. MS was associated with insulin resistance, but not with a prothrombotic state in this age group. Maternal, but not paternal obesity appears to be a risk factor for MS in obese adolescents.

## T3:PS.66

**Effects of 10% weight loss induced by moderate restriction in carbohydrate and saturated fat intake on postprandial triacylglycerolemia.**Sidossis L<sup>1</sup>, Maraki M<sup>1</sup>, Aggelopoulou N<sup>1</sup>, Christodoulou N<sup>1</sup>, Panagiotakos D<sup>1</sup>, Kavouras S<sup>1</sup>, and Toutouzas P<sup>2</sup><sup>1</sup>Laboratory of Nutrition & Clinical Dietetics, Department of Nutrition and Dietetics, Harokopio University<sup>2</sup>Hellenic Heart Foundation, Athens, Greece

Obesity is associated with impaired postprandial triacylglycerolemia, an independent risk factor for atherosclerosis. Very low-carbohydrate diets decrease postprandial triacylglycerol levels, presumably by suppressing triacylglycerol hepatic secretion. However, they are criticised for their high saturated fat content. In this study we examined the effects of 10% weight loss induced by a low-carbohydrate low-saturated fat diet on postprandial triacylglycerolemia. Twelve obese but otherwise healthy, sedentary, men and women (age: 38.2 ± 3.3 years, body mass index: 34.8 ± 1.3 kg m<sup>-2</sup>) performed two oral fat tolerance tests, before and after 10% weight loss. Dietary intervention consisted of low carbohydrate intake (60g/day for the first two weeks followed by a stepwise 10g increase the following weeks if weight loss was greater than 0.3 kg/week), restriction in saturated fat intake, and increased in protein, mono- and polyunsaturated fatty acids intake. Subjects lost 10.4 ± 0.6% of their initial body mass after 15 ± 2 weeks. Homeostasis model assessment of insulin resistance (HOMA-IR) was 47% lower after intervention (P<0.01). Postprandial concentrations of plasma triacylglycerols and serum insulin were 41% and 50% lower, respectively, after dietary intervention (P<0.01), whereas postprandial glucose concentrations were not different. Delta HOMA-IR was correlated with changes in postprandial concentrations of plasma triacylglycerols (r=0.678, P=0.015). It is concluded that moderate restriction in carbohydrate and saturated fat intake comprises an alternative intervention to reduce body mass and attenuate postprandial triacylglycerolemia and insulinaemia possibly through increases in insulin sensitivity.

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## T3:PS.67

**Sagittal abdominal diameter, as a marker of visceral adipose tissue, in patients with metabolic syndrome**Stokias E<sup>1</sup>, Tomiã-Nagliã D<sup>1</sup>, Srdiã B<sup>2</sup><sup>1</sup>Department Of Endocrinology, Medical Faculty<sup>2</sup>Department of Anatomy, Medical Faculty

Intraabdominal fat mass has been described as an independent risk factor for coronary heart disease. Sagittal abdominal diameter has been found to be closely related to the amount of visceral adipose tissue.

The aim of our study was to evaluate the relationship between supine sagittal abdominal diameter (SAD) and other indicators of fat distribution and body size with cardiovascular risk factors in patients with metabolic syndrome.

The study was conducted in a group of 200 patients (age: 36,68 +/- 10,65 years, BMI: 37,55 +/- 5,87 kg/m<sup>2</sup>) with metabolic syndrome (defined using the ATP-III guidelines) in whom, apart from standard measures (weight, height, BMI, waist), SAD was measured by means of specially constructed caliper (Holtain Kahn Abdominal Caliper). Overall, SAD showed a slightly higher correlation with most cardiovascular risk factors, especially with insulin resistance (HOMA-IR 0,260, p<0,001), insulinemia (0,250, p<0,001), HDL-Cholesterol (0,158, p<0,05), systolic and diastolic blood pressure (p<0,01) than other anthropometric measures. A significant correlation was observed between SAD and calculated 10-year Framingham CHD risk. SAD showed a stronger correlation to 10-year Framingham CHD risk (+0,224) than waist circumference (+0,199). When adjustments were made for age and BMI, the correlation became slightly stronger between SAD and HOMA-IR.

The results suggest that SAD, as a simple, cheap and noninvasive anthropometric measurement, could be a clinically useful marker of risk factors and insulin resistance in patients with metabolic syndrome.

## T3:PS.69

**Genetic epidemiology of glucose homeostasis and adiposity traits in rural area of Brazil**Velãquez-Melãndez, G<sup>1</sup>, Parra, F<sup>2</sup>, Gazzinelli A<sup>1</sup>, Rodrigo Correa-Oliveira<sup>2</sup>, Williams-Blangero S.<sup>3</sup><sup>1</sup>Escola de Enfermagem, Universidade Federal De Minas Gerais<sup>2</sup>Centro de Pesquisas Rene Rachou-FIOCRUZ<sup>3</sup>Department of Genetics, Southwest Foundation for Biomedical Research, San Antonio, USA

**Objective:** The main purpose of this study was to investigate whether phenotypes of glucose homeostasis are genetically dependent and whether this control is shared with other adiposity traits. This relationship is still unknown particularly in Brazilian populations.

**Methods:** The Jequitinhonha Community Family Study was based in above 18 years old probands. Extended pedigrees were constructed using the pedigree based data management software PEDSYS. Eighty eight percent (n=252) of the individuals belonged to a single pedigree which was highly informative for genetic analysis. A total of 285 individuals (m:136, f:149), aged 18-88 years were sampled. The degree of insulin resistance was assessed by homeostasis model assessment (HOMA-IR) method. Levels of fasting serum high-density lipoprotein cholesterol (HDL-C), triglycerides and anthropometric parameters (BMI, waist circumference and mid upper arm circumference) were also measured in each subject. Overall heritability and bivariate variance-components analyses were performed using the SOLAR software. All estimates were adjusted by sex and age. Heritability estimates for glucose metabolism traits ranged from 19% to 47% (p<0.005). The highest heritability estimated was for glucose (h<sup>2</sup>=47%, p<0.000). Significant genetic correlations (P < 0.05) were observed between HOMA-IR and BMI ( $\rho_g=0.64$ ), waist circumference ( $\rho_g=0.60$ ), HDL-C ( $\rho_g=-0.60$ ). Serum insulin levels were also correlated with the same traits. Additionally there were significant environmental correlations between those traits, except with HDL-C.

**Conclusions:** These results indicate that in rural Brazilian population glucose metabolism traits is highly heritable and share common genetic effect with body adiposity traits supporting the role of these traits as a potential determinants of diabetes and cardiovascular diseases.

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## T3:PS.68

**Sagittal abdominal diameter is associated with Arterial stiffness and Left ventricular mass in patients with type 2 diabetes**Tengblad, A<sup>1</sup>, Lãnne, T<sup>1</sup>, Engvall, J<sup>2</sup>, Lindström, T<sup>2</sup>, Mõlsted, S<sup>1</sup>, Nyström, F<sup>2</sup>, Östgren, CJ<sup>2</sup><sup>1</sup>Department of Medical and Health Sciences, Linköping University, Sweden<sup>2</sup>University hospital of Linköping, Sweden

**Background:** The aim was to explore the association between the anthropometric measures; BMI, Waist and Sagittal Abdominal Diameter (SAD), and Aortic Pulse Wave Velocity (PWV) and Left Ventricular Mass (LVM) in patients with type 2 diabetes.

**Methods:** We analysed data from 288 patients with type 2 diabetes who participated in the ongoing observational CARDIPP (Cardiovascular Risk factors in Patients with Diabetes – a Prospective study in Primary care) study in Sweden. Nurses in primary care measured blood pressure and the anthropometric measurements. Blood samples were taken for analyses of HbA1c, serum lipids and C-reactive protein (CRP). LVM was measured with M-mode echocardiography. Aortic PWV was measured with applanation tonometry (Sphygmocor<sup>®</sup>) over the carotid and femoral arteries.

**Results:** There were significant correlations between aortic PWV and BMI (r=0.23; p<0.01), Waist (r=0.20; p<0.01) and SAD (r=0.21; p<0.01). LVM was also correlated to BMI (r=0.41; p<0.01), Waist (r=0.48; p<0.01) and SAD (r=0.48; p<0.01).

When further comparing the measures of central obesity and the correlation with PWV by stratifying for gender, the correlation between PWV and SAD was significant in both genders (men: r=0.18; p=0.01, women: r=0.26; p=0.01). However, in a corresponding analysis between PWV and Waist, the correlation was significant only in men (men: r=0.23; p<0.01, women: r=0.16; p=0.10).

**Conclusions:** BMI, Waist and Sagittal Abdominal Diameter were associated with arterial stiffness and LVM in patients with type 2 diabetes. When exploring the associations by gender, SAD appears to be superior to Waist in predicting arterial stiffness in female patients with type 2 diabetes.

## T3:PS.70

**Relationship between white blood cells number and total body fat as well as visceral fat, in smoking and non-smoking subjects.**

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**Introduction:** Obesity is currently considered as a low-grade inflammatory state.

**Aim:** To investigate any relationship between White Blood Cells (WBC), a clinical marker of inflammation, and obesity.

**Subjects-Methods:** We studied retrospectively 247 males and 355 females from our outpatient clinic. A) Exclusion criteria: medications affecting WBC, infections, liver dysfunction, sedimentation rate>40, WBC>11,000/mm<sup>3</sup>, thyroid dysfunction, type-1 diabetes and uncontrolled type-2 diabetes. B) Fasting blood measurements: hematology, sedimentation rate, biochemistry, HbA1c, insulin and HOMA-IR. C) Anthropometry: BMI, Waist Circumference (WC), WHR, % Total Body Fat (BIA-TBF) and Sagittal Abdominal Diameter (SAD) for calculation of visceral fat (kg).

**Results:** A) Males had higher WBC than females (7,394±1,584 vs. 6,995±1,495, p=0.002). B) Smokers had higher WBC than non-smokers in both sexes (males: 7,849±1,566 vs. 7,168±1,548, p=0.001, females: 7,321±1,353 vs. 6,775±1,549, p=0.001). C) Significant correlations: 1) WBC to BMI: non-smoking males: r=0.186, p=0.017, non-smoking females: r=0.306, p=0.000. 2) WBC to BIA-TBF: non-smoking males: r<sub>s</sub>=0.156, p=0.045, non-smoking females: r<sub>s</sub>=0.288, p=0.000 and smoking females: r<sub>s</sub>=0.180, p=0.037. 3) WBC to WC: non-smoking males: r=0.198, p=0.012, non-smoking females: r=0.291, p=0.000. 4) WBC to SAD: non-smoking males: r=0.177, p=0.025, non-smoking females: r=0.289, p=0.000 and smoking females: r=0.177, p=0.042. 5) WBC to kg of visceral fat: non-smoking males: r=0.164, p=0.038, non smoking females: r=0.288, p=0.000 and smoking females: r=0.177, p=0.042. 6) WBC to HOMA-IR: non-smoking females: r<sub>s</sub>=0.285, p=0.000.

**Conclusions:** Smoking is important inducer of inflammation as expressed by WBC number, mainly in males. In non-smoking males and in females irrespectively of smoking, WBC are related to obesity, and more importantly to sagittal abdominal diameter and kilograms of visceral fat.

## T3:PS.71

## Infant size as a predictor of childhood and adult obesity

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**Introduction:** METRIC is an international collaboration of birth cohort studies that aims to identify the optimal infant predictors of later obesity. The current analysis aims to identify which marker of attained infant size (infant weight, BMI or length) best predicts later BMI and obesity risk.

**Patients and methods:** We performed a meta-analysis of data from 4 cohorts (ALSPAC, HAGUENAU, SWEDES and NFBC), totalling 5648 adults (age 17 to 31 years) and 1042 children (age 6 to 8 years). Infant size was expressed as age and sex-adjusted SD scores (SDS) and analyses were adjusted for childhood or adult height.

**Results:** In separate models, infant weight, BMI and length were all positively associated with adult BMI and accordingly each was predictive of adult obesity OR (95% CI) per +1 SDS of infant weight: 1.34 (1.22-1.48), BMI: 1.29 (1.18-1.40), and length: 1.11 (0.99-1.25). In multivariate models, risk of adult obesity was positively and independently associated with both infant BMI (1.31 [1.20-1.42]) and infant length (1.13 [1.02-1.26]). The results were consistent in each cohort, and similarly both infant BMI ( $p < 0.0001$ ) and infant length ( $p = 0.003$ ) contributed independently to childhood BMI.

**Conclusion:** Both larger infant BMI and greater infant length are independent predictors of later BMI and adult obesity. Infant weight, being a composite of infant BMI and length, represents the best single infant size marker of later obesity. Data from 5 further cohorts will be included to assess the predictive abilities of specific thresholds of infant size.

## T3:PS.72

## The cannabinoid CB1 antagonist, rimonabant, improves hepatic mitochondrial function in rats fed a high fat diet

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The endocannabinoid system has recently emerged as an important regulator of energy homeostasis, involved not only in the control of food intake but also in the regulation of energy metabolism at peripheral level. We have investigated the effect of rimonabant on hepatic mitochondrial function in rats fed a high fat diet. Sprague Dawley rats fed a high fat diet during 13 weeks were treated with rimonabant during the 3 last weeks and matched with pair-fed controls. Body weight and fat mass were decreased in rats treated with rimonabant compared to pair-fed controls. Moreover, adiponectin was increased with rimonabant. An increase of mitochondrial respiration was observed in rats treated with rimonabant. Especially an increase of mitochondrial respiration with palmitoyl CoA compared to respiration with palmitoyl-L-carnitine stating that the entry of fatty acids in mitochondria via the carnitine palmitoyl transferase 1 was increased in rats treated with rimonabant. Moreover rimonabant has caused a reduction in the enzymatic activity of the ATP synthase whereas the quantity of mitochondrial DNA and the activity of the citrate synthase were remained unchanged. That seems to indicate that oxidation of respiratory substrates was increased in order to compensate the reduction of ATP synthesis but without variation of mitochondrial density. The results obtained suggest that rimonabant has a beneficial effect on mitochondrial function by facilitating fatty acids oxidation, thereby reducing fatty liver and so takes part in the increase of insulin sensitivity observed under rimonabant treatment.

## T3:PS.72

## Measuring body fat in obese adolescents: a comparison of two methods

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**Background:** Measuring body composition in obese children and adolescents is fundamental for evaluating the success of various treatment strategies. Currently, there are limited data available on the body composition of obese children and adolescents, and suitable methods for measuring change in percentage body fat are required.

**Objectives:** To compare the use of two different body composition tools, Bioelectrical Impedance Analysis (BIA, TANITA TBF - 305) and Air Displacement Plethysmography (ADP, BOD POD Body Composition System, Life Measurement Incorporated) for the estimation of body fat percentage in obese children and adolescents.

**Design:** Body fat percentage was measured by BIA and ADP. The bias between the two methods was evaluated by Bland-Altman analysis.

**Results:** 28 subjects (11 male, 17 female), mean age 13.2 years and mean BMI z-score of 2.23 (SD 0.03). Mean BIA % fat was 45.6% (SD 12.9), and mean ADP % fat was 47.6% (SD 9.1). There was reasonable agreement between the two methods with a bias of 2.6 % (SD 14.1) although the 95% CI limits were considerable (-25.6 to 30.7%). The correlation ( $r = -0.32$ ,  $p = 0.095$ ) between the two measurements of body fat and their difference suggests that the bias was not consistent across the measured % body fat in this study to date. Nevertheless, the correlation was not statistically significant.

**Conclusions:** Although there was reasonable agreement between the measures at a group level, individual differences varied considerably. BIA and ADP should not be used interchangeably to measure body composition in obese children and adolescents.

## T3:PS.73

## Blood glucose control in children varies according to BMI: application of the disposition model

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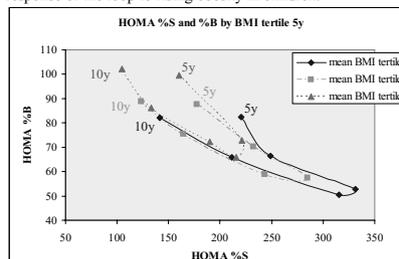
**Introduction:** The hyperbolic relationship between insulin sensitivity (%S) and secretion (%B) defines the behaviour (disposition) of the glucose-insulin control loop, and is central to the derivation of HOMA. The disposition model is providing new insights into glucose control by mapping %S against %B over time.

**Aim:** To examine the impact of BMI on the contributions of insulin sensitivity and secretion to glucose control over a 5-year period in healthy children.

**Methods:** 218 healthy children (126 boys) from the EarlyBird cohort were examined on six occasions annually from 5-10y. Measures: BMI(SD), HOMA-S% (1/HOMA-IRx100), HOMA-B%. Children were divided into tertiles according to BMI at 5y (T3=heaviest).

**Results:** Mean BMI 5y 0.32SD, 10y 0.51SD. Fasting glucose rose progressively from 5-10y (4.3-4.8 mmol/l,  $p < 0.001$ ). %B was higher, and %S lower, in T3 than T1 throughout. An unexpected switch in direction of disposition occurred in all tertiles (graph). The switch occurred earlier (6-7y), and at lower sensitivity (221%), in T3 compared with T1 (7-8y, 331%).

**Conclusion:** A loop constantly seeks maximum gain to optimise control of its output (glucose). The switch in disposition is a novel observation which demonstrates how the loop reverts to beta cell reserve once insulin sensitivity becomes constrained. BMI appears to be a crucial determinant of the stage at which the inflexion occurs. Disposition mapping may help us better understand the response of the loop to rising obesity in children.



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## T3:PS.75

## Which obesity indicators are better predictors of metabolic risk?

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**Objective:** No consensus exists as to the most sensitive and specific obesity indicator associated with metabolic risk factors. We aimed to validate anthropometry as predictors for obesity-related metabolic risk factors through comparison with direct body composition measures in Korean adults.

**Methods and procedures:** Nine hundred and ninety-five Korean women and 577 Korean men who participated in the Healthy Twin study were subjects. Anthropometric measurements included BMI, waist circumference (WC), waist-to-hip ratio (WHR), and waist-to-height ratio (WHTR). Direct body composition measures included percentage of body fat (%BF) measured using dual-energy X-ray absorptiometry scanners and bioelectrical impedance analyzer (BIA). The following criteria were used to define abnormal metabolic risk factors: blood pressure  $\geq 130/85$  mmHg, fasting glucose ( $\geq 100$  mg/dL), insulin ( $\geq 25$   $\mu$ U/mL), homeostasis model assessment (HOMA) ( $\geq 2.61$ ), HDL ( $< 40$  mg/dL for men or  $< 50$  mg/dL for women), triacylglycerol ( $\geq 150$  mg/dL), uric acid ( $> 7$  mg/dL for men or  $> 6$  mg/dL for women), hs-CRP ( $\geq 2.11$  mg/L).

**Results:** In multiple regression analyses (adjusted for age, education, smoking, alcohol, exercise and past/current medical history, and treated families as a random effect), WC, WHTR, and BMI were consistently associated with all metabolic risk factors regardless of subject's gender. Some of the areas under the receiver-operating characteristic curves regarding abnormal metabolic risk factors were significantly higher for the three indicators of central obesity than for %BF.

**Discussion:** Our study validates the usefulness of anthropometry over direct body fat measures to predict metabolic risks.

**Key words:** anthropometry, percentage of body fat, obesity indicators, metabolic risk factor

## T3:PS.77

## Effect of menopausal status on adiponectin levels in healthy women. The RISC study

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**Objective:** To examine the influence of menopausal status on serum adiponectin levels in non-diabetic women.

**Subjects and methods:** The study group consisted of 727 non-diabetic women (550 premenopausal-Pre and 177 postmenopausal -Post, age 30-60 yrs, BMI: 17- 42.9 Kg\*m<sup>2</sup>) from 19 centers in 14 European countries. We measured anthropometric characteristics, insulin sensitivity by standardized euglycemic insulin clamp, physical activity by questionnaire and adiponectin levels.

**Results:** Post women were older (53.6  $\pm$  4.2 yrs vs. 41.3  $\pm$  6.7 yrs,  $p < 0.001$ ), had higher BMI (26.1  $\pm$  4.1 Kg\*m<sup>2</sup> vs. 24.4  $\pm$  4.3 Kg\*m<sup>2</sup>,  $p < 0.001$ ) and waist circumference (84.4  $\pm$  12.4 cm vs. 80.1  $\pm$  11.4 cm,  $p < 0.001$ ) compared with Pre women, while insulin sensitivity and physical activity levels were comparable. After adjustment by centre, BMI was not significantly higher in the Post women. Paradoxically, adiponectin levels were significantly higher in Post women compared with pre women (10.6  $\mu$ g\*ml<sup>-1</sup>  $\pm$  4.2 vs. 9.7  $\pm$  3.6  $\mu$ g\*ml<sup>-1</sup>,  $p < 0.05$ ). However after adjustment for center (F: 2.82,  $p < 0.001$ ), age (F=7.68,  $p < 0.01$ ), BMI (F: 0.38,  $p = 0.53$ ) and waist circumference (F=26.15,  $p < 0.001$ ), menopausal status was not associated with significant differences in adiponectin levels (F=1.68,  $p = 0.19$ ).

**Conclusion:** Menopausal status is associated with increased adiponectin levels. This finding might indicate an adaptive mechanism involved in the preservation of insulin sensitivity during menopausal transition.

## T3:PS.76

## Utility of the Modified ATP III Definition of the Metabolic Syndrome for prediction of Cardiovascular Risks in Tehranian Adolescents in a 3-Year Follow-up: Tehran Lipid and Glucose Study (TLGS)

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**Objectives:** To assess the utility of a modified Adult Treatment Panel III definition of the metabolic syndrome (MetS) among adolescents as a predictor of cardiovascular risks in a three-year follow-up.

**Methods:** A clustered-random sample of 334 boys and 458 girls (12-17 years old) was recruited from TLGS and was followed-up for a three-year interval. Presence of components of MetS was determined at the two intervals. Odds ratio of developing MetS was studied with regard to the presence/absence of each of its component at the beginning of the study.

**Results:** Mean $\pm$ SD ages were 15.2 $\pm$ 2.2 and 18.7 $\pm$ 2.5 years at the first and second interval. The prevalence of MetS was 9.2%(95%CI, 7.2%-11.2%) at the beginning (MetS1) of the study and 7.1%(95%CI, 5.1%-8.7%) in the follow-up (MetS2). The most frequent component was low high-density lipoprotein cholesterol (42.6% and 66.3% at first and second interval, respectively). Kappa for agreement between the diagnosis of MetS in the two intervals was 0.301( $P < 0.001$ ), and the odds ratio for having MetS after three years among those diagnosed at the beginning was 9.6(95%CI, 5.2-17.8,  $P < 0.001$ ). By building a logistic regression model, inclusion of high triglyceride level, waist circumference, and blood pressure in the first interval produced an odds ratio of 3.9, 10.8 and 4.7, respectively for diagnosis of MetS-2 (all  $P < 0.001$ ) and removed MetS-1 from the model.

**Discussion:** Although definition of MetS shows a fair agreement within a three-year interval, attaining some components of MetS seems to be good predictors of developing MetS during a short time.

**Funding:** This study is funded by the Research Institute for Endocrine Sciences, affiliated to the Shaheed Beheshti University of Medical Sciences, Tehran, Iran.

## T3:PS.78

## Prevalence of obesity and metabolic syndrome in Greek preadolescents. The PROGRESS study.

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**Introduction:** As childhood obesity increases it also contributes to an increasing incidence of the metabolic syndrome (MS). The aim of the current study was to record the prevalence of these adverse health conditions among Greek preadolescents.

**Materials and methods:** The "Prediabetes, Obesity and Growth Epidemiological Study in Schoolchildren" (PROGRESS) examined a sample of 370 primary schoolchildren (9-13 years old) with complete data on certain anthropometric (weight, height, waist circumference), biochemical (fasting plasma glucose and serum lipids levels) and clinical (blood pressure) indices. The IOTF references were used for the definition of overweight and obesity. MS was diagnosed by abdominal obesity and the presence of two or more other clinical features (ie, elevated triglycerides, low HDL-cholesterol, high blood pressure, or increased plasma glucose) based on the new International Diabetes Foundation definition.

**Results:** The prevalence of overweight and obesity was 31.3% and 11.4%, respectively. Regarding the clinical features of the MS, abdominal adiposity was recorded for 8.9% of the total sample. Furthermore, 2.6% of children were diagnosed with elevated serum triglycerides, 17.4% with low HDL-cholesterol, 8.8% with hypertension and 15% with increased plasma glucose levels. The prevalence of the MS was 3% in the total study population and 21.2% in the obese subjects.

**Conclusion:** The prevalence of overweight, obesity and MS reported by the present study are considerably high and comparable to those reported by similar recent studies conducted with children. Because the number of overweight children is increasing continuously, there is a vital need to develop appropriate screening and prevention strategies.

**Conflict of Interest:** Yannis Manios also works as a part-time scientific consultant for Friesland Foods Hellas. None of the other authors had any potential conflict of interest.

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## T3:PS.79

**A diet rich in n-3 fatty acids could help to control body weight**

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It is becoming increasingly important in our society to understand the aetiology and to stop the epidemic of obesity and its' related disorders. Metabolic syndrome is a cluster of several risk factors characterised by insulin resistance which can lead to type 2 diabetes. We studied here the impact of the inner quality of food products on metabolic syndrome.

**Method:** 160 men and post-menopausal women aged 18 to 65 years with metabolic syndrome were randomly assigned to a standard diet or a diet containing products naturally rich in omega-3 with similar macronutrients content for 3 month. After the 3-month diet, subjects returned to a free diet but were asked to come back after 2 and 5 months to be measured. 14 subjects from the control group and 14 from the test group also had blood samples taken.

**Results:** no statistical differences were found between the two groups during the 3 month intervention diet. During follow-up, the Body Mass Index (BMI) of the subjects who were in the control group increased significantly more than the BMI of the former test group (+0.58 kg/m<sup>2</sup> ±0.90 vs. +0.12 ±1.09 respectively, p=0.04). Lipid profile also improved for the 14 subjects in the test group and deteriorated in for the 14 in the former control group.

**Conclusion:** during the 3-month diet, the quantitative impact of the caloric restriction masked the difference between products. During the follow-up, the qualitative aspect predominated and showed that omega-3 fatty acids are potentially beneficial on medium term to help weight management.

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## T3:PS.82

**Obesity and its comorbidities in a rural african population.**

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**Introduction:** Obesity, hypertension and diabetes are increasingly common in developing countries. Assuring Health for All in the Free State is a research project aimed at determining how living in rural areas influences the lifestyles of populations, predisposing them to chronic diseases.

**Methodology:** This study forms part of a prospective and longitudinal epidemiological study. Adults aged 25 and 64 years from three rural areas in South Africa were included. Socio-demographic and anthropometric data was collected and medical examination and blood sampling was done.

**Results:** 553 adults (male=163, female=390) were included. In the age groups 25-45 and 46-65 years respectively, 84.1% and 72.0% of males were normal or underweight (BMI < 25). In the younger and older age groups respectively, 66.9% and 64.8% of females were overweight or obese (BMI > 25). Elevated blood pressure (>140/90 mmHg) was measured in 31.2% males and 40.2% females (25-45 years) and 64.7% males and 62.3% females (46-65 years). In the younger group, 46.2% of males and 54.7% of females who reported receiving hypertension treatment, had elevated blood pressure measurements, while in the older group, these percentages were 74.6% and 66.3% for males and females respectively. Blood glucose levels >7.1 mmol/L were measured in 47.5% of patients with diabetes mellitus and in 2.6% of non-diabetics.

**Conclusion:** Most of the females in this population were overweight or obese, while most men were normal or underweight. A large percentage of hypertensive and diabetic patients had elevated blood pressure and blood glucose levels respectively.

## T3:PS.80

**Metabolic characteristic of obese children with prediabetes**

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**Objectives:** The presence of impaired fasting glucose (IFG) and/or impaired glucose tolerance (IGT) is considered as prediabetes when found in obese children. Its metabolic background comparison to obese children with normal glucose tolerance (NGT) was the aim of study.

**Methods:** 40 IFG/IGT and 308 NGT obese children with the same anthropometric measures (BMI-SDS 3.7±1.6; age 12.3±3.5) underwent IVGTT and OGTT with insulin, proinsulin and C-peptide estimations; HOMA-IR, WBISI were calculated too. Other investigations included: family health history, lipids, fibrinogen, aminotransferases, abdomen ultrasonography.

**Results:** T2DM in family history was in 32.5% of patients with prediabetes and 20.3% of NGT (p<0.01). 42.5% of IFG/IGT and 22.2% of NGT (p<0.0001) had acanthosis nigricans. In OGTT, IFG/IGT vs. NGT patients had higher insulin: AUC 0-120min (p<0.03), 120-0min mean value (p<0.001) and at 120min (p<0.0001); C-peptide 120-0min mean value (p<0.04) and at 120' (p<0.009); proinsulin at 120' (p<0.01). HOMA-IR was higher (4.81±3.76 vs. 3.61±2.8; p<0.03) and WBISI was lower (2.81±1.57 vs. 4.4±3.63; p<0.04) in prediabetic children. In IVGTT, patients with IFG/IGT revealed reduced response during the first 3'(171.5±75.5mU/L) and 5'(249.6±99.5mU/L) in comparison to NGT (292.1±151.2 and 431.9±216.5mU/L; p<0.04). NAFLD was more frequent (20% vs. 12.9%; p<0.01) and fibrinogen (mg/dl) was higher (417.0±88.6 vs. 363.9±85.7) in prediabetic than NGT patients (p<0.03).

**Conclusions:** Obese children with reduction of the first phase insulin release are close to T2DM, however, there are other advanced disorders caused by insulin resistance too. So, the results suggest to presume an insulin resistance as enough to early diagnosis of prediabetes.

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## T3:PS.84

**A complex approach to the treatment of endometrial hyperplasia in obese women.**

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Obesity is a pathology associated with other considerable health problems, including endometrial hyperplasia and cancer.

**Objective:** to assess the efficacy of orlistat and hormonal therapy in the treatment of the endometrial hyperplasia in obese women.

**Methods and subjects:** we treated 61 obese women with histologically confirmed endometrial hyperplasia. Group I - simple hyperplasia (32 patients) were treated with levonorgestrel intrauterine device, group II - complex hyperplasia with/without atypia (29 patients) were treated with medroxyprogesterone acetate (MPA) 150 – 500 mg weekly during 6 month. From each group 15 patients additionally were receiving orlistat 360 mg per day.

**Results:** treatment of endometrial hyperplasia was successful in both groups. In the first group the frequency of hyperplasia recurrence was 2%, in the second one – 20%. Side effects of progestins such as increasing of weight and glucose intolerance (II group) were observed in group without orlistat. There were a weight loss and normal results of GTT and lipids after orlistat with progestin.

**Conclusions:** Orlistat combined with progestin was confirmed to improve tolerability and decrease the adverse events in treating the obese women with endometrial hyperplasia.

## T3:PS.85

**Effect of 5-week high- or low-glycemic index regimen on glucose metabolism in overweight non-diabetic subjects**

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\* J-AN and SN are both co-authors of the present abstract

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Numerous studies have highlighted the beneficial effect of low-glycemic index (LGI) products on metabolic parameters. Considering that LGI products present by definition a better glycemic profile than high-glycemic index (HGI) ones, we investigated the influence of a medium-term diet enriched with either LGI or HGI products, on the management of the postprandial glycemic profile.

In this 5-week randomized study, 38 overweight subjects (BMI 27.3 +/- 1.5 kg/m<sup>2</sup>), replaced their usual starchy foods with either LGI or HGI ones. The GI was significantly different between groups (p<0.0001) with no difference in carbohydrates or caloric content. On Day1 and Day36, glucose metabolism (glycemia, insulinemia, total and exogenous glucose rate of appearance (RaT and RaE), endogenous glucose production (PEG)) was assessed following either a HGI or a LGI <sup>14</sup>C-labeled breakfast.

On Day1, the areas under the curve (AUC) of glycemia, RaT, RaE, PEG, and the glycemic peak were significantly lower after the LGI breakfast (p<0.05), but there was no difference in the insulinemic response. No significant diet\*time interaction was found for any parameter after 5 weeks. In fact, on Day36, LGI breakfast kinetics were similar to Day1 whereas a trend to a decrease was observed for HGI parameters; as a result, only RaE was lower in the LGI group (p<0.05).

The intake of a LGI breakfast improved the short term metabolic tolerance to a meal compared to a HGI breakfast. Interestingly, the LGI beneficial effect was steady but not enhanced by a 5-week LGI diet, whereas the HGI effect remained more variable.

1. Breakfast cereals supplied by Danone Vitapole, France.
2. Research relating to this abstract was funded by the European Union (EUROSTARCH project). Contract n° QLK1-2001-00431

## T3:PS.87

**Total antioxidant capacity of diet negatively correlates with metabolic syndrome manifestations in healthy young adults with higher values of body mass index**

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**Introduction:** Oxidative stress has been related to the development of obesity and other chronic diseases. Furthermore, antioxidant intake has been suggested to protect against oxidative damage and related complications. The objective of this study was to assess the potential association between the total antioxidant dietary capacity (TAC) and several early metabolic syndrome manifestations in healthy young adults.

**Methods:** Anthropometric variables and blood pressure of 101 healthy participants (20.5±2.6 y) included in this study were measured. Dietary intake was assessed by a validated food-frequency questionnaire (SUN), which was used to calculate the TAC and to adjust it by daily energy intake. Fasting blood samples were collected for measuring serum glucose concentrations. Subjects were categorized by the median of body mass index (BMI), whose ranges were: 17.4-21.2 kg/m<sup>2</sup>, 21.2-29.3 kg/m<sup>2</sup>.

**Results:** TAC was inversely correlated with body weight (r=-0.433; p=0.001), BMI (r=-0.294; p=0.028), waist circumference (r=-0.324; p=0.015), serum glucose (r=-0.292; p=0.038) and systolic blood pressure (r=-0.355; p=0.007) in subjects with the highest BMI (percentile 50 and over), whereas HDL-cholesterol (r=0.247) and waist circumference (r=-0.233) showed only a statistical trend (p=0.084). No correlations were found with TAC in subjects with lower values of BMI.

**Conclusions:** These data suggest that TAC, as a measure of antioxidant intake, may be also a potential marker of the risk to develop obesity and metabolic syndrome features in healthy subjects.

**Funding:** Research relating to this abstract was funded by the Health Department of the Government of Navarra (22/2007), the Línea Especial about Nutrition, Obesity and Health (LE/97), and the ADA fellowships scheme of the University of Navarra.

## T3:PS.86

**Leptin mediates basal and adiponectin peripheral insulin sensitivity in normal||and overweight type-2 diabetic subjects with plurimetabolic syndrome**

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Insulin sensitivity can be partitioned into basal (hepatic) and peripheral (muscle, adipose tissues) sensitivity. Adipocytokines are important fat mediators for glucose homeostasis in insulin-resistant subjects. However, relationships of abdominal fat with the basal and dynamic components of insulin sensitivity have not been yet elucidated.

**Aim:** was the assessment of possible relationships of adiponectin and leptin with these components of insulin sensitivity in overweight type-2 subjects (T2DM) with plurimetabolic syndrome.

**Methods:** T2DM (5F/11M; 59±2 yr; duration=5±1 yr; HbA1c=6.7±0.1%; BMI=29.5±1.1 kg/m<sup>2</sup>; waist=104±2 cm; basal glucose=134±5 mg/dl; basal insulin=9.4±1.2 µU/ml; uric acid=5.3±0.3 mg/dl) and 16 matched overweight controls (CTN) underwent a 75g-2h OGTT. Lipid profile was (mg/dl): cholesterol=204±8, HDL=53±3, LDL=119±8, triglycerides(TG)=168±27. Abdominal fat was determined as cardiovascular risk factor LAP [lipid overaccumulation=(waist-k)×TG; k=gender constant]. Basal insulin sensitivity was measured with QUICKI index and the peripheral one with OGIS.

**Results:** LAP was 66±8 cm×mM/L. T2DM and CNT adiponectin (7.4±0.5, 7.8±0.9 µg/ml), leptin (13±3, 13.3 ng/ml) and QUICKI (0.39±0.01, 0.39±0.01) were not different (p>0.2); OGIS (317±11, 406±12.6 ml min<sup>-1</sup>m<sup>-2</sup>) was lower in T2DM, p=0.0001. LAP inversely correlated with OGIS (R=-0.57, p=0.026) and QUICKI (R=-0.56, p=0.022) only in T2DM. Cytokines were normalized to BMI (adiponectin=0.25±0.02; leptin=0.42±0.08). Leptin inversely correlated with QUICKI (R=-0.45, p=0.009), adiponectin directly with OGIS (R=0.43, p=0.015), in all subjects.

**Conclusions:** Lipid overaccumulation plays a major role in insulin sensitivity impairment. Adipocytokines mediate insulin resistance, but have different sites of action: adiponectin operates at peripheral tissues level; leptin is active mainly on fasting (liver) sensitivity and is not relevant in diabetic state.

## T3:PS.88

**Serum alanine aminotransferase levels stand as a surrogate marker of left ventricular hypertrophy in morbidly obese individuals: cross-sectional study**

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**Background:** Alanine aminotransferase (ALT) is a marker of non-alcoholic fatty liver disease (NAFLD), predicts type 2 diabetes mellitus (DM2) as well as coronary events independently of traditional risk factors and the features of the metabolic syndrome. The extent to which left ventricular hypertrophy (LVH), another surrogate marker of cardio-vascular disease (CVD) is associated with ALT levels in morbidly obese (MO) individuals is still unknown.

**Materials & Methods:** Cross-sectional pilot-study involving 169 MO asymptomatic young Caucasian participants. Participants disclosing ALT in the upper tertile (ALT > 36 UI/L) were considered to have NAFLD. IR was assessed using the HOMA index. Standard echocardiograms were used to define left ventricular mass (LVM) and interventricular wall thickness (IVWTh). LVH was defined as IVWTh ≥ 12 mm.

**Results:** Age=37.9 ± 0.8 years old. Gender (M45/F124). Body mass index=45.9 ± 0.5 kg.m<sup>2</sup>. NAFLD was found in 30.2% of the participants (M57.8%/F21.2%). As compared with the first tertile, those in the upper tertile disclosed significantly higher HOMA (P=0.003), diabetes (P=0.002) and hypertension (P=0.01) prevalence, LVH prevalence (P<0.0005) and left ventricular mass (P<0.0005). Significant correlations were found between ALT levels and LVM (P<0.0005), IVWTh (P<0.0005), HOMA (P=0.004), gender (P<0.0005) and serum creatinine (P<0.0005). The correlation between ALT and IVWTh persisted after adjustment for the gender, HTN, DM2, HOMA and creatinine levels (P<0.005).

**Conclusions:** NAFLD is very common in MO individuals and appears significantly associated to LVH even after adjustment for the previous confounders. NAFLD stands as a promising surrogate marker for LVH in the morbidly obese.

## T3:PS.89

**Differences in Cardiovascular Risk Between Overweight and Obese Adolescents**Costa Reis, P<sup>1</sup>, Cardoso, K<sup>1</sup>, Rodrigues, T<sup>2</sup>, Fonseca, H<sup>1</sup>.1. Department of Paediatrics, Hospital de Santa Maria, Lisboa, Portugal.  
2. Biomathematics Laboratory, Lisbon University Medical School, Portugal.**Introduction:** Obesity in adolescence has increased, in association with cardiovascular risk factors.

This review aimed at identifying cardiovascular risk factors in adolescents attending an Obesity Outpatient Clinic and assessing the differences in cardiovascular risk between overweight and obese adolescents.

**Methods:** Retrospective review based on the clinical charts of the last clinical and laboratory evaluation of the adolescents attending the Obesity Outpatient Clinic, from October 2005 to September 2007.

The parameters subject to review were Body Mass Index (BMI), blood pressure (BP), fasting glucose and lipid profile.

**Results:** The population included 220 adolescents, 55% female, mean age:15 years. In the last evaluation only 3.2% were normal weight, 24.1% overweight (P85<BMI ≥ P95) and 72.7% obese (BMI ≥ P 95). All had normal glucose levels. Blood pressure ≥ 90<sup>th</sup> percentile was found in 18.2% of the patients. Cholesterol and triglycerides values were above the 95<sup>th</sup> percentile in 10,6% and 23,5% of the patients respectively. LDL-C was above the 95<sup>th</sup> percentile in 4,5%, and HDL-C was below the 5<sup>th</sup> percentile in 4,0% of the patients.There was a weak statistic association between BMI above the 95<sup>th</sup> percentile and high blood pressure (OR: 8,619 IC 95%: 1,990-37,329; C: 0.242, p=0,001). No association was found between BMI and high cholesterol or triglycerides.**Conclusion:** There was a statistical association, although weak, between obesity and high blood pressure. The risk of having high cholesterol or triglycerides was similar between overweight and obese children.

Because cardiovascular risk was not exclusive of the obese condition according to our results, the importance of including overweight adolescents in multidisciplinary programs at an earlier stage becomes reinforced.

## T3:PS.91

**Effects of a soluble dietary fiber supplementation with NUTRIOSE<sup>®</sup> FB on risk factors of the metabolic syndrome in Chinese male adults.**Lefranc-Millot, C<sup>1</sup>, Wils, D<sup>1</sup>, Pochat, M<sup>1</sup>, Li, S<sup>2</sup><sup>1</sup>Roquette Group, Lestrem, France; <sup>2</sup>Institute of Nutrition, Health and Food, Tongji University Medical College, Shanghai, China

The metabolic syndrom (MS) includes abdominal obesity among its mains underlying risk factors. The prevalence of overweight in the Chinese adult population is estimated at 23% (WHO classification of Body Mass Index = BMI). Among preventive solutions, dietary factors, including fiber supplementation, are to be considered among the modifiable risk factors, in particular against overweight and hypertension.

A clinical placebo controlled trial investigated the impact of NUTRIOSE<sup>®</sup> FB, a soluble dietary fiber, on some MS characteristics. 120 overweight Chinese male volunteers were enrolled in two groups receiving in beverage either 18 g NUTRIOSE<sup>®</sup> FB, equivalent of 14 g dietary fiber (NG) or 17 g standard maltodextrin (PG) at the same time, twice daily, for 12 weeks. The endpoints examined included comparisons of body weight (BW), BMI, body fat (BF), waist circumference (WC) and systolic blood pressure (SBP) between the two groups at baseline and throughout the study. 17 volunteers of the NG and 15 of the PG were presenting MS at baseline. Noted decreases in BW (p<0.001), BMI (p<0.0001), BF (21.5% to 21.2%, p<0.005) and WC (N.S.) were noted from month to month throughout the study in the NG. Abdominal scans indicated a final significant reduction of abdominal wall fat thickness in NG compared to PG (p<0.033). There was no difference between groups for SBP. Among participants presenting MS initially, 47% from NG and only 14% from PG were no longer classified with MS after 12 weeks. Dietary intervention through NUTRIOSE<sup>®</sup> 06 supplementation significantly modified biological markers of metabolic syndrome.

## T3:PS.90

**“Correlation of serum high sensitivity C – reactive protein level to various grades of obesity in an Asian population”**Deshpande, N<sup>1</sup>, Kapoor, N<sup>1</sup>, Sadanand, C,D 1, Dahiya, L<sup>2</sup>, Aman, S,D<sup>2</sup><sup>1</sup> K.L.E's Prabhakar Kore Hospital and MRC, Belgaum, India; <sup>2</sup> Belgaum Diabetes Centre, Belgaum, India**Background:** Very little data exists about relationship of inflammatory markers to obesity in Asian population, that is ethnically prone to Metabolic Syndrome.**Aim:** To correlate high sensitivity C – reactive protein (hs-CRP) to anthropometric parameters, plasma lipids and various grades of obesity**Methodology:** Hundred subjects (aged 20-60 years) attending K.L.E's Prabhakar Kore Hospital and MRC over one year were enrolled. They were grouped into Controls (BMI: 18.5 – 23 kg/m<sup>2</sup>) and Cases (BMI > 23 kg/m<sup>2</sup>) respectively. Exclusion criteria : Ischaemic Heart Disease, infection/inflammation, trauma, diabetes, hypertension, smoking, systemic diseases. Anthropometry (BMI, waist circumference –WC, waist hip ratio – WHR) was done. CRP levels were measured using nephelometry, a latex particle-enhanced immunoassay**Results:**

- N=100 (39 females and 61 males)
- Mean hsCRP 3.55±1.88 mg/l, range: 0.5 - 11.0 mg/l
- Mean BMI 25.74±4.07 kg/m<sup>2</sup>; range: 18.75 - 36.71 kg/m<sup>2</sup>
- Mean WC females 93.46 ±10.12 cms; range: 69 - 116 cms & males 94.130±10.73 cms ; range : 69 - 120 cms
- Mean hs-CRP (females) 4.12 ±2.43 mg/l Vs 3.19±1.32 mg/l (males).
- Mean hs-CRP (obese group) 3.9±1.96 mg/l Vs 2.42±0.9 mg/l (nonobese group). (p<0.0001).
- On regression analysis correlation of hs-CRP with anthropometric values was stronger for BMI (r=0.51) and WC (r=0.42) than for WHR (r=0.32).
- hs-CRP concentration was classified risk-wise into low (<1mg/l), average (1-3 mg /l) & high (> 3mg/l), based on CDC / AHA guidelines. High levels correlated well to the obese group.
- Among the lipids- hypertriglyceridemia was significantly associated with elevated hs-CRP.

## T3:PS.92

**The Role of Resistin in Endothelial Dysfunction through Induction of Proinflammatory Cytokines in Nondiabetic Obese Men. Focused on Tumor Necrosis Factor – α (TNF-α), Interleukin – 6 (IL-6), Monocyte Chemotactic Protein – 1 (MCP-1), and Vascular Cell Adhesion Molecule – 1 (VCAM-1).**Meiliana, A<sup>1,2</sup>, Wijaya, A<sup>1,2</sup>, Petellongi, I<sup>2</sup>.<sup>1</sup> Prodia Clinical Laboratory, Bandung, Indonesia<sup>2</sup> Hasanuddin University, Makassar, Indonesia

Many previous studies reported that central obesity is related to inflammation and endothelial dysfunction. It also has been reported that resistin can induce proinflammatory cytokines which could be result in endothelial dysfunction.

The aim of this study is to asses how resistin plays its role in influencing the proinflammatory cytokines TNF-α, IL-6, and the chemokine MCP-1 in nondiabetic central obesity individuals. We hope that the results of this study can help to make a strategy for earlier preventing of endothelial dysfunction, especially for obese individuals.

This study was a crosssectional with 73 men subjects. The results showed a significant correlation between resistin and TNF-α (r = 0,274, p&lt;0,005), and a significant correlation between TNF-α and IL-6 (r = 0,430, p&lt;0,001). We found that at high concentration of resistin, the concentration of TNF-α, IL-6 and MCP-1 will be increased, then affect to the increase of VCAM-1 (p = 0,0030). We also found significant correlations between waist circumferences and inflammation (hsCRP, r = 0,296 p&lt;0,005 , IL-6, r = 0,374 p&lt;0,001 and HOMA IR, r = 0,331 p&lt;0,001).

Finally, the study showed the role of resistin in endothelial dysfunction occurs in a high concentration of resistin through induction of proinflammatory cytokines TNF-α, IL-6, and chemokine MCP-1, where the inflammation process occurs in obesity started with a positive feedback loop mechanism between resistin and TNF-α.

## T3:PS.93

**Association between insulin resistance, cardiovascular risk factors diet and physical activity in Greek preadolescents. The PROGRESS study.**

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**Introduction:** Recent research suggests that cardiovascular disease (CVD) and type 2 diabetes originate in childhood. The aim of the present study was to examine the association between insulin resistance (IR), CVD risk factors, dietary and physical activity indices in Greek prepubertal children.

**Materials and methods:** The "Prediabetes, Obesity and Growth Epidemiological Study in Schoolchildren" (PROGRESS) examined a sample of 870 primary schoolchildren aged 9-13 years old. Data included anthropometric (weight, height, waist circumference), biochemical (fasting plasma glucose, serum lipids and insulin levels), clinical (blood pressure), dietary and physical activity (assessed with pedometers) indices. The IOTF references were used for the definition of overweight and obesity. Insulin and glucose were used estimate IR (HOMA-IR). All analyses were adjusted for gender and Tanner stage.

**Results:** The prevalence of overweight and obesity was 31.3% and 11.4%, respectively. IR was observed in 35.5% and 52.6% of overweight and obese children, respectively, and was associated with elevated triglycerides (>150 mg/dl), low HDL-cholesterol (<40 mg/dl) and increased waist circumference (>90<sup>th</sup> percentile for age, sex). Dietary energy intake was positively related to IR, while increased dietary intakes of carbohydrates and fiber significantly decreased the likelihood of IR. Similarly physical activity levels were also inversely related to IR.

**Conclusion:** Insulin resistance was very common in overweight and obese children, especially in subjects with central obesity. Children with IR were also found to have unfavourable levels of certain cardiovascular risk factors. Increased dietary fiber intake and physical activity levels seem to have a protective effect on the development of IR.

**Conflict of Interest:** Yannis Manios also works as a part-time scientific consultant for Friesland Foods Hellas. None of the other authors had any potential conflict of interest.

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## T3:PS.95

**Effect of amount or source of carbohydrate content of dinner on fasting blood glucose level and post breakfast glycaemic and insulinemic response in type2 diabetic patients referring to iran university of medical sciences'institute of endocrinology and metabolism**

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**Introduction and Objectives:** Diets of low glycemic load (GL) may dampen the postprandial glucose response which is beneficial for managing insulin resistance. The GL can be reduced by decreasing either carbohydrate intake or glycemic Index (GI). The present study was carried out to investigate whether these 2 dietary maneuvers have the same effects on postprandial plasma glucose and insulin concentrations in subjects with type 2 diabetes.

**Materials and Methods:** A quasi-experimental study following approval by Iran University of Medical Sciences' Ethics Committee for Human Studies, was conducted on 15 newly-onset type 2 diabetic patients (age: 52.8±9.26 y; BMI: 25.17±2.69 Kg/m<sup>2</sup>; disease duration; 2.7±1.8 y; Fasting blood glucose: 128.00 ± 25.58 mg/dl). The subjects received the 3 experimental dinners on 3 occasions with one week intervals. The features and percentage of macronutrient contribution to energy content of three meals were as follows: 1- medium-GL diet (62% CHO, 23% PRO, 15% fat; GL=50), 2- low-GL, low-GI diet (62% CHO, 23% PRO, 15% fat; GL=38) and 3- low-GL, low-CHO diet (52% CHO, 25% PRO, 23% fat; GL=38). Venous blood samples were collected before (after 12 hours fasting), 60 and 120 minutes after consumption of the standard breakfast (63% CHO, 17% PRO, 20% fat; GL=20). Serum glucose concentrations were determined by the glucose oxidase method. Serum insulin assays were performed by the IRMA. The data were analyzed by Repeated ANOVARM.

**Results:** Only varying the carbohydrate amount (and not the GI) had an effect on 60-minute postprandial glucose response and incremental area under the curve (AUC) for glucose, although not significant (P values of 0.062 and 0.059 respectively). Varying neither the GI nor the carbohydrate amount had a significant effect on insulin response.

**Conclusions:** Dietary GL can predict postprandial glucose levels in diabetic patients. Reducing the GI of the diet had different effects on glycemic response compared to reducing dietary carbohydrate intake. The 2 dietary maneuvers didn't have any significant effects on blood insulin levels.

**Key Words:** Type 2 diabetes, Glycemic Load, Glycemic Index, Carbohydrate content, Glycemic response, Insulinemic response.

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## T3:PS.94

**Waist circumference and other indices of health in UK men.**

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There has been much posturing over the validity and relevance of waist circumference (WC) as an indicator of health, much of the data generated has been collected from individuals with health problems visiting clinicians; this could skew the results. This paper presents data from 266 men (19-84yrs) visiting Motorway service stations during 2007.

Men were offered 'spare tyre checks' at health check stations involving answering health-related questions and measurements of blood pressure, sugar and cholesterol, body composition by BIA (Tanita BC-420MA) and WC (inches).

WC was found to correlate with anthropometrical measures.

	Weight (kg)	Fat Mass (kg)	Fat Free Mass (kg)	Muscle mass (kg)	Visceral fat	BMI (kg/m <sup>2</sup> )	Fat %
r	0.884	0.867	0.556	0.556	0.783	0.884	0.702
p	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
n	263	262	262	262	262	262	262

Although these correlations are significant, relationships between WC and unhealthy measures (fat mass, visceral fat, BMI, and Fat %) are stronger relationships than with other measures of fat free mass and muscle mass. WC correlates with pulse rate (r=0.226, p=0.024), but not with age indicating that the health correlates identified are a risk in any age.

Waist size was put into four categories <37 normal; 37-40 large; 40-45 very large and over 45 serious. Analysis between the four WC categories revealed significant differences for diastolic blood pressure (F<sub>(3,262)</sub>=5.793 p < 0.001), with diastolic blood pressure progressively increasing with WC (p < 0.001)

Data suggests that WC has a relationship with negative health indicators.

## T3:PS.96

**High nafld degree influences on multidisciplinary obesity intervention**

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**Background:** Non-alcoholic fatty liver disease is an emerging clinical problem among patients of all ages, includes a broad spectrum of liver tissue alterations and different degrees of steatosis.

**Objective:** to assess the influence of NAFLD degree in multidisciplinary obesity intervention.

**Methods:** 75 adolescents aged 15-19 y, with BMI ≥ P95, consisting of 49 patients without and 26 with NAFLD, diagnosed by ultrasonography were submitted to long-term multidisciplinary intervention (1 year) (nutrition, psychology, exercise and clinical support). Blood samples were collected to analyze glycemia, hepatic transaminases, lipid profile, ghrelin and adiponectin levels. Insulin resistance and insulin sensibility was measured by HOMA-IR and QUICK. Analyses of food intake were made by 3 days recordatory inquiry.

**Results:** At baseline conditions, the NAFLD patients showed significant increases in body mass, BMI, visceral fat, HOMA-IR, QUICK, triglycerides, VLDL and in hepatic transaminases. Nineteen patients had a low grade of steatosis (grade 1 of the Brunt classification) and 7 patients had a high grade of steatosis (grade 2 or 3). After the intervention, the body mass, BMI, visceral fat, QUICK, ALT and AST, energy and macronutrients intake were reduced significantly in all patients. BMI, insulin, HOMA-IR, QUICK and ALT were significantly higher in patients with a high grade of steatosis. It was observed a positive correlation between NAFLD degree and visceral fat, insulin, HOMA-IR and hepatic transaminases levels.

**Conclusion:** Important clinical parameters present more altered in obese patients with NAFLD, mainly according the NAFLD degree and it is essential to consider it in a long-term multidisciplinary obesity intervention.

## T3:PS.97

**“First visit” study: role of visceral obesity in type 2 diabetes mellitus patients evaluated for the first time in a specialistic unit.**Disoteo, O<sup>1</sup>, Pizzi, G<sup>1</sup>, Muratori, F<sup>2</sup>, Fossati, C<sup>1</sup><sup>1</sup> Diabetology and Metabolic Disease Unit, Niguarda Hospital, Milan, Italy  
<sup>2</sup> Endocrinology Unit, Niguarda Hospital, Milan, Italy

Aim of this study was to evaluate the role of obesity on type 2 diabetes mellitus and on metabolic profile in a population of 540 type 2 diabetic outpatients (231 F/309 M) appraised for the first time, during the last year, in our specialist metabolic unit. Patient's median age was 66ys (range 31-92), age at the disease onset 63ys (range 18-84). Values recorded were: median glicated haemoglobin 7,7% (range 4,8-11), fasting plasma glucose (FPG) 160 mg/dL (range 110-380), BMI 29 Kg/m<sup>2</sup> (range 21-44,4), total chol was 210 mg/dL (range 97-333), HDL chol 51 mg/dL (range 26-94), triglycerides 147 mg/dL (range 42-570); LDL chol mean was 119 ± 40,37 mg/dL. The prevalence of visceral overweight/obesity (BMI > 25Kg/m<sup>2</sup>, waist circumference > 80 cm for females and > 94 cm for males) was 94,7% (511 pts), of normal weight was only 5,3% (29 pts). Moreover we have found a direct correlation among BMI and HbA1c (p=0,0024), HDLchol (p=0,015), LDLchol (p=0,02), tryglicerides (p=0,01), no correlation among BMI and TC and FPG were found. Our results show the high prevalence of overweight/obesity in type 2 diabetic patients, the onset of diabetes mellitus in the middle age, elevated HbA1c, FPG, total chol and LDL chol values at the first specialistic visit, in consideration of a median disease time of 12 months. These data corroborate the central role of overweight/obesity in explosion and development of type 2 diabetes mellitus and in several of its metabolic alterations.

## T3:PS.99

**Infant formulae might contribute to future obesity and associated chronic diseases through activating inflammatory pathways in infancy**

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It is well known that although obesity and accompanying chronic diseases (e.g. hypertension, diabetes, and atherosclerosis) become evident in adulthood, they are founded early in childhood and even in infancy. Inflammation is proposed as a strong contributor to the initiation and/or development of all of these health conditions. On the other hand, in some studies higher rates of obesity and associated chronic diseases have been documented in the later stages of lives of formula-fed infants compared to breast-fed ones.

It is thus speculated that infant formulae prompt susceptibility to obesity and so called chronic diseases through activation of inflammatory pathways early in the course of growth and development. Formula-fed infants might have a higher level of systemic inflammation compared to breast-fed infants. Although the difference between the levels of inflammation in these two groups might be too low to be detected with routine tests, it can trigger the destructive metabolic changes during the several months of the infant's contact with the formulae.

In fact, the suggested higher level of inflammation in formula-fed infants has been proposed based on the infant-formula protein and omega-3 fatty acid contents. The proteins in infant-formulae are derived from non-human sources and are more probable than breast-milk proteins to induce immune responses in infant's body. Moreover, the initiated inflammatory pathways are less probable to be suppressed in formula-fed infants than in breast-fed infants. The reason is the lower level of anti-inflammatory prostaglandins in formula-fed infants due to the little omega-3 fatty-acids they receive from the formulae.

## T3:PS.98

**High prevalence of metabolic syndrome among police personnel in India.**

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**Aims:** There is a paucity of data on the prevalence of diabetes and metabolic syndrome in different occupational categories in India. The aim of this study was to find out the prevalence of metabolic syndrome (MS) among police personnel and to compare with general population (GP).

**Methods:** Two populations similar in demography were selected for this comparative study. A total of 719 men aged ≥ 30 years from north, central and south zones of Chennai, were randomly selected (police n = 318, GP, n = 401) with a response rate 76.3%. Fasting blood samples were collected and glucose and lipid profile were estimated. Prevalence of MS was determined using modified ATP III criteria.

**Result:** The prevalence of metabolic syndrome (58.2 Vs 28.2 %;  $\chi^2 = 64.5$ , p<0.0001) was significantly higher among police personnel compared to GP. Increased waist circumference (65.1 Vs 32.7%;  $\chi^2 = 73.6$ , p<0.001), increased BMI (62.9 % Vs 35.4 %,  $\chi^2 = .52.6$ , p < 0.001), increased Triglycerides (49.7% Vs 40.6%,  $\chi^2 = 5.5$ , P= 0.02), and hypertension (58.5 Vs 29.2,  $\chi^2 = 61.3$ ; p < 0.0001) were present among police personnel in comparison with GP.

**Conclusions:** Prevalence of metabolic syndrome and all other abnormalities were significantly higher among the police personnel when compared to general population. Further research is required to determine the causes and intervention strategies be planned.

## T3:PS.100

**Role of Neuropeptide Y (NPY) and Alpha-Melanocyte Stimulating hormone (a-MSH) in obesity induced hypertension (HPT) – Preliminary results.**Baltazi M<sup>1</sup>, Hatzitolios A<sup>1</sup>, Koliakos G<sup>2</sup>, Befani Ch<sup>2</sup>, Savopoulos Ch<sup>1</sup>, Alevizos M<sup>1</sup>, Zamboulis Ch<sup>1</sup><sup>1</sup> Propedeutic Medical Department, AXEPA Hospital, Aristotles University of Thessaloniki, Greece<sup>2</sup> Department of Biological Chemistry, Aristotles University of Thessaloniki, Greece<sup>2nd</sup> Propedeutic Medical Department, Hippokraton Hospital, Aristotles University of Thessaloniki, Greece

**Introduction:** Obesity and co-existing hypertension are the commonest causes of atherosclerosis. Human mechanisms controlling energy balance are complicated. Peptides as the orexigenic NPY and anorexigenic a-MSH and their interaction in hypothalamus are believed that lead in increased sympathetic nervous activity, possibly responsible for HPT.

**Aim of the study:** NPY and a-MSH correlation with obesity induced hypertension

**Methods:** 160 non diabetic individuals, under no medical treatment, mean age 46,7 ± 11,14 years, were divided in 6 groups according to body mass index (BMI), as obese-Ob (BMI ≥ 30), overweight-Ow (25 ≤ BMI < 30) and normal-Nr (BMI < 25) and blood pressure (BP), as hypertensives-Hts or normotensives-Nts, according to JNC 7. Group I: Hts-Nr, II: Hts-Ow, III: Hts-Ob, IV: Nts-Nr, V: Nts-Ow, VI: Nts-Ob. NPY and a-MSH were calculated with ELISA. Statistical analysis was made by oneway ANOVA.

**Results:** NPY/ a-MSH (ng/ml): Group I: 0.315/0.383, II: 0.552/0.414, III: 0.710/0.415, IV: 0.408/0.440, V: 0.373/0.454 VI: 0.416/0.431. NPY increase was statistically significant (p<0.001) in group III compared to all others and in group II compared to I, IV, V, VI, whereas decrease was significant (p<0.001) in group II compared to III. Among Hts, NPY increased significantly (p<0.001) in groups II and III compared to I, but not among Nts in IV, V and VI (p>0.05). a-MSH showed no difference in any group.

**Conclusions:** NPY (but not a-MSH) significantly increased in overweight and especially obese hypertensives compared to normal weight hypertensives and normotensives (even overweight and obese). NPY increase could be responsible for obesity induced HPT, something that needs further research and could lead to new therapeutical approaches.

## T3:PS.102

**Abdominal fat, lipid profile, insulin sensitivity and the Pro12Ala PPARgamma polymorphism in non-obese healthy subjects**

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In the 1980s the concept that some individuals with normal weight (Metabolically Obese, Normal-Weight) have metabolic disturbances related to obesity was created. Since then, there have been only several studies in non-obese subjects.

We analyzed anthropometric variables, body fat distribution by DXA and frequency of insulin resistance (IR) and dyslipidemia in 431 healthy Polish subjects: 232 women (age 32 ± 5.5 yrs; BMI 21.3 ± 2.7 kg/m<sup>2</sup>) and 199 men (age 30 ± 6 yrs; BMI 24.9 ± 2.9 kg/m<sup>2</sup>). The Pro12Ala PPARgamma polymorphism was studied by PCR in all subjects.

In women abdominal fat volume was significantly correlated with systolic and diastolic blood pressure (p=0,001), serum level of fasting glucose (p=0,001) and insulin (p<0,001), IR indices: HOMA-IR and FIRI (p<0,001), and insulin sensitivity index QUICKI (p<0,001). Strong correlations between abdominal fat volume and serum lipid profile: triglycerides, HDL-C, LDL-C (p<0,001), and atheromatosis risk indices: LDL-C/HDL-C, Castelli and AIP (p<0,001) were also observed. We found no significant correlation between abdominal fat volume and serum cholesterol in women (p=0,11).

The same significant correlations, excluding systolic blood pressure (p=0,14) and serum fasting insulin (p=0,14), were observed in men. On the contrary to women, in men abdominal fat volume was strongly correlated with serum cholesterol (p<0,001).

There were no correlations between PPARgamma polymorphism, abdominal fat content and metabolic parameters.

In conclusion, there are strong correlations between abdominal fat volume and insulin sensitivity and the risk of atheromatosis in non-obese young healthy subjects.

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## T3:PS.104

**Prevalence of insulin resistance syndrome among greek obese children and adolescents.**

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**Purpose:** To assess prevalence of the Insulin Resistance Syndrome (IRS) in obese Greek children and adolescents.

**Methods:** IRS was defined, according to the modified WHO criteria, as the presence of at least three of the following abnormalities: obesity, abnormal glucose homeostasis, dyslipidaemia and hypertension. The study group consisted of 260 obese children, 159 girls (61%), aged 5.4 –15.2 years. All children underwent an oral glucose tolerance test, measurement of fasting lipids and blood pressure determination.

**Results:** Abnormal glucose homeostasis was identified in 45% (hyperinsulinism in 29% impaired glucose tolerance in 15.5% and impaired fasting glucose in 0%) Only 1 subject had type 2 diabetes. Dyslipidaemia (cholesterol/triglycerides >95<sup>th</sup> centile and/or HDL<5<sup>th</sup> centile for Greek normal values) was identified in 27.5% and hypertension (BP>95<sup>th</sup> centile) in 27%. 29% of subjects in our study group had only obesity, 44% had two components, 21% had three and 6% had all four components. The prevalence of IRS was higher among pubertal subjects

**Conclusions:** The prevalence of IRS is quite high (27 %) among obese children and adolescents in Greece. However, type 2 diabetes is rare. The development of a screening program for IRRS components in obese children would enable the early identification of a high risk group in need of targeted intervention

## T3:PS.103

**Waist circumference percentiles for Bulgarian children and adolescents, aged 6-18 years**

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**Background:** Waist circumference (WC) reflects the fat distribution and the degree of central adiposity in children, which is specifically associated with cardiovascular risk factors and useful as a component of metabolic syndrome definition in children. Reference standards for WC are not established in Bulgarian children.

**Aim:** To develop the first age- and sex-specific WC reference values for Bulgarian children/adolescents.

**Design/methods:** Cross-sectional study of a representative sample of 3810 healthy children/adolescents (53.9% boys), aged 6–18 years in 2006/2007. Body weight, height and WC were measured using standard procedures and BMI was calculated. The overweight/obesity prevalence for each age group both for boys and girls was estimated using IOTF reference. Smoothed percentile curves and values were defined for each age group within sex.

**Results:** WC increased with age as its mean values tended to be higher in males than in females, the difference being more significant from 11 years of age onwards. For girls, curves began to plateau at the age of 14 years whereas for boys waist percentile curves continued to increase after this age. Smoothed percentile curves and percentile values for the 5th, 10th, 25th, 50th, 75th, 90th, and 95th percentiles were developed for boys and girls. In girls the prevalence of overweight/obesity decreased at 11 years of age and was persistently lower than male prevalence after that.

**Conclusion:** These are the first WC reference data for Bulgarian children/adolescents which can be used for both clinical and epidemiological research, and added to the existing WC international reference values.

## T3:PS.105

**Thyroid function in obese children and adolescents. In relation with components of metabolic syndrome**

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An association between thyroid function and components of the metabolic syndrome in euthyroid subjects has been reported recently. The aim of the study was to evaluate the prevalence of thyroid function abnormalities in obese children and adolescents and examine the possibility of an association between them and components of metabolic syndrome. T<sub>3</sub>, T<sub>4</sub>, TSH and antithyroid antibodies were determined in 380 obese children and adolescents (154 boys), aged 3.0 to 15.5 years and in 150 healthy children of normal weight matched for age and sex. All obese children had blood pressure measurements and plasma glucose, insulin, cholesterol, triglyceride and HDL determinations, while 260 of them underwent an OGTT as well. Median values of T<sub>3</sub> and TSH of obese children were significantly higher than those of normal weight children. A positive correlation was observed between thyroid hormone concentrations and BMI z-scores of obese children. After adjustment for age, gender, sex and BMI z-scores, no significant correlation was found between T<sub>3</sub>, T<sub>4</sub>, TSH levels and HDL, cholesterol, or BP z-scores. However, an association was observed between TSH and HOMA-IR (r=0.22, p<0.01). In the group of 260 children who underwent OGTT, 70 (27%) were identified as having metabolic syndrome according to the WHO modified criteria. These children had also significantly higher TSH levels (p<0.05) compared to the rest of obese children. In conclusion, our findings suggested an association between thyroid function and at least two of the components of metabolic syndrome (obesity and insulin resistance) in obese children and adolescents, which needs further investigation.

## T3:PS.107

**In addition to insulin resistance and obesity, atherosclerosis is strongly associated with metabolic syndrome in Chinese - A population-based study (Taichung Community Health Study, TCHS)**

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**Backgrounds:** To investigate the association between atherosclerosis (present with brachial-ankle pulse wave velocity (baPWV)) and metabolic syndrome (MetS) in a population-based middle-aged Chinese.

**Methods:** MetS was defined using the American Heart Association and the National Heart Lung Blood Institute criteria. A total of 1291 subjects aged 40 years and over were recruited in 2004 from a metropolitan city in Taiwan. The homeostasis model assessment was applied to estimate the degree of insulin resistance (HOMA-IR). baPWV were divided into four groups by quartiles.

**Results:** The prevalence of metabolic syndrome and its individual components were increased by the increase of baPWV quartiles. After adjusting for age, body mass index, HOMA-IR, smoking, alcohol drinking, betel nut chewing, and physical activity status, multiple logistic regressions revealed that baPWV groups were significantly associated with MetS. Compared with the baPWV quartile I, the adjusted odds ratio of having MetS for baPWV quartile II, III, IV were 2.09(1.17~3.73), 2.60(1.40~4.82), 6.01(2.96~12.2) in men, and 2.74(1.20~6.28), 10.5(4.66~23.4), 9.70(4.03~23.4) in women, respectively. The prevalence of MetS was also increased with the increase of age, HOMA-IR, and body mass index groups.

**Conclusions:** In addition to insulin resistance and obesity, atherosclerosis was strongly related to MetS among middle-aged Taiwan Chinese. Routine screening of baPWV is necessary to early detect MetS.

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## T3:PS.109

**Iranian overweight children and adolescents: who are seeking weight loss treatment?**

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**Objective:** This study described overweight/obese children and adolescents seeking weight loss treatment regarding their age, gender, severity of obesity and maternal education in *Rasht City*, northern Iran.

**Design:** A descriptive study on overweight children and adolescents

**Setting:** The main clinic of obesity management in Rasht, northern Iran.

**Subjects:** Data on 1465 overweight/obese children and adolescents aged 2-18 yrs engaged in weight loss program were analyzed in this study. These data included age, sex, weight, height; self reported parental weight and height, history of dieting, and mother's level of education.

**Results:** Overweight/obese girls engaged in weight loss program more than overweight/obese boys (71.2% vs. 28.8%  $p < 0.0001$ ). Only 3.2% of the children were in age group 2-6 years. These data showed that 18.2% of the overweight/obese children and adolescents were from families with low maternal education and the remainders were from families with high maternal education. Mean excess body weight was not different across educational levels although the boys were heavier than girls at. These findings showed that the maternal body weight was related to the child's excess weight ( $r=0.26$   $P < 0.0001$ ).

**Conclusion:** These data suggest that parents of overweight/obese children and adolescents from low social level, boys and young children across all maternal educational levels should be warned against risk of their children's accelerated growth.

## T3:PS.108

**Women with diabetes might have vascular protection via increased adiponectin and HDL levels**Ljubic, S, Boras, J<sup>1</sup><sup>1</sup>Vuk Vrhovac University Clinic, Zagreb, Croatia

**Aims:** The aim of the study was to compare adiponectin (ApN) values in patients with diabetes.

**Methods:** One hundred and four patients with type 1(D1) and type 2(D2) diabetes, and a control group(D0) were included in the study. Type 1 patients were on intensive insulin treatment.

**Results:** A significant difference in ApN was found (Mann-Whitney U test) between male(B) and female(A) patients ( $6.96 \pm 3.7$  vs.  $9.90 \pm 6.36$ , respectively;  $p=0.005$ ). The same groups revealed a significant difference in HDL ( $p=0.003$ ) (A- $1.46 \pm 0.52$  and B- $1.34 \pm 0.36$ ), but not in CRP ( $p=0.507$ ). A significant difference in ApN [ANOVA:F22.18,df=2, $p < 0.0001$ ] was found among D1 ( $13.46 \pm 7.45$ ), D2 ( $6.10 \pm 2.38$ ) and D0 ( $8.01 \pm 3.91$ ) groups. The Tukey post hoc test pointed to a significant difference in ApN between D0 and D1, and D1 and D2, but not between D0 and D2 groups. A significant difference was also found among D0, D1 and D2 groups in fasting blood glucose [F9.72,df=2, $p=0.0002$ ], HDL-cholesterol [F6.51,df=2, $p=0.0022$ ], uric acid [F5.55,df=2, $p=0.0083$ ] and BMI [F7.55,df=2, $p=0.0009$ ]. ApN showed a statistically significant correlation ( $p < 0.05$ ) with HDL (D1: $r=0.65$  and D2: $r=0.31$ ) and BMI (D1: $r=-0.49$  and D2: $r=0.35$ ) in both type 1 and type 2 diabetes. The best model for ApN in D1 ( $R^2=0.9034$ ) obtained by stepwise regression procedure included BMI (parameter estimate [p.e.] $=-1.74$ , $p=0.0223$ ) and sex (p.e. $=-8.44$ , $p=0.052$ ). Uni-variant results for regression for D2 showed that only BMI was statistically significant ( $R^2=0.083$ ) for ApN (p.e. $=0.125$ , $p=0.028$ ).

**Conclusions:** Women and type 1 diabetics revealed increased serum ApN and HDL concentrations important in vascular protection.

## T3:PS.110

**Dietary fish oil improved glucose and lipid metabolism in diabetic KKA<sup>y</sup> mice.**Okamura, C<sup>1</sup>, Umezaki, T<sup>1</sup>, Muraki, E<sup>2</sup>, Ebata, M<sup>2</sup>, Tsunoda, N<sup>2</sup>, Kasono, K<sup>2</sup><sup>1</sup> Graduate School of Pharmaceutical Sciences, Josai University, Saitama, Japan<sup>2</sup> Department of Clinical Dietetics and Human Nutrition, Faculty of Pharmaceutical Sciences, Josai University, Saitama, Japan

Recently, it has been shown the efficacy of fish oil on the control of diabetes mellitus (DM). However, it has not yet examined that the dose-dependent effects of fish oil in the diet therapy on diabetes compared with beef tallow. Therefore, we investigated which type of oil or energy ratio is more important in the therapy of diabetic mice.

5-wk-old female KKA<sup>y</sup> mice were divided into 4 groups and fed by high-fat diets (fat energy: 30%) or high-carbohydrate diets (fat energy: 10%) using beef tallow (B30,B10) or fish oil (F30,F10) for 9 wks after induced DM by a high-fat diet for 3 wks.

Energy intakes in each group were not significantly changed. Final body weight was not significantly changed, but liver weight was lower in F30 and F10 than that in B30 and B10. Fasting plasma glucose and insulin levels in 10wks were lower in high-carbohydrate diets (B10, F10) than that in high-fat diets (B30, F30). In glucose tolerance test in 11wks, blood glucose levels were lower in F30 and F10. Furthermore, plasma total cholesterol, triglyceride, nonesterified fatty acid and hepatic triglyceride levels were also decreased, and adiponectin levels were significantly increased in F30 and F10.

It seems only a few differences of many biomarkers between 10% and 30% of fat energy, but fish oil is remarkably improved in glucose and lipid metabolism compared with beef tallow. Accordingly, we recommend that the diet containing fish oil (10~30 energy %) has almost the same therapeutic effects on diabetes in KKA<sup>y</sup> mice.

## T3:PS.111

Is the metabolic syndrome associated *per se* with chronic inflammation?

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**Objective:** The aim of the present study was to determine systemic inflammation in obese women with and without metabolic syndrome.

**Material and methods:** 102 obese women without any diseases on the basis of IDF criteria were divided into 2 groups: with metabolic syndrome (n = 45, age 53.4 ± 9.2 y, BMI: 37.8 ± 5.3 kg/m<sup>2</sup>) and without metabolic syndrome (n = 57, age 38.4 ± 11.4 y, BMI: 35.6 ± 4.9 kg/m<sup>2</sup>). Serum concentrations of TNF - α, sTNFRs and NO metabolites were assayed with ELISA kits. Insulin was determined by radioimmunoassay and glucose by colorimetric method. HOMA was calculated.

**Results:**

	With metabolic syndrome	Without metabolic syndrome
Body mass (kg)	99.9 ± 16.3	92.9 ± 14.8*
Body fat (kg)	45.5 ± 12.8	40.6 ± 12.5*
Waist circumference (cm)	110.8 ± 14.2	101.2 ± 13.5*
Glucose (mmol/l)	5.5 ± 1.3	4.7 ± 0.4 *
Insulin (μIU/ml)	20.3 ± 10.9	18.1 ± 11.8
HOMA	5.1 ± 3.4	3.8 ± 2.7 *
TNF - α (pg/ml)	6.4 ± 2.1	7.3 ± 3.5
sTNFR1 (pg/ml)	1249.7 ± 247.4	1310.3 ± 386.8
sTNFR2 (pg/ml)	1946.8 ± 643.7	1894.3 ± 498.4
NO metabolites (μmol/l)	33.9 ± 9.6	32.1 ± 8.7

\* p < 0.05

**Conclusion:** Our findings suggest that metabolic syndrome is not associated with chronic inflammation *per se*.

## T3:PS.113

## Effect of low-fat and low-carbohydrate diets on weight loss and metabolic parameters

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**Background:** According to certain publications diets restricted in carbohydrates with high glycemic indexes exceed the weight reducing and metabolic benefits of low-fat diets.

**Objectives:** Our aim was to compare the influence of low-carbohydrate and low-fat diets on anthropometric, metabolic parameters and other biochemical markers.

**Methods:** We started a non-pharmacological weight-reducing treatment program for obese female patients with metabolic syndrome with a 600 kcal/day hospital treatment, then 91 patients received a 1200 kcal/day low-carbohydrate (low glycemic index) diet, while 30 patients consumed a low-fat diet with similar energy intake for 3 months.

**Results:** Low-carbohydrate diet resulted in significantly higher (p=0.02) weight loss of a mean 8.56 kg (from 102.33±18.64 to 93.77±18.1 kg; -8.4%), than low-fat diet (6.06 kg weight loss, from 97.06±21.48 to 90.6±17.4 kg, -6.6%). Similar changes were observed in the low-carbohydrate group compared to the low-fat one in abdominal circumference (-8.03% vs. -2.69%, p=0.023), in BMI (-8.39% vs. -4.33%, p<0.0001), in body fat percentage (-7.57% vs. -2.46%, p=0.013) as well. Lipid profile improved significantly in the low-carbohydrate group (Chol: -5%, p=0.0128, Tg: -23.2%, p<0.0001), similarly to carbohydrate metabolism (glucose: -12.58%, p<0.0001, HOMA:-37.25%, p=0.03). We observed a significant decrease in the inflammatory marker CRP in the low-carbohydrate group (p<0.05). Serum leptin produced by adipocytes decreased (p<0.0001), as adiponectin increased significantly with weight loss (p<0.05). In the low-fat group these parameters (HOMA, CRP, leptin, adiponectin) did not change significantly, and lipid peroxidation elevated substantially (p=0.016).

**Conclusions:** This study indicated that low-carbohydrate diets are more effective than low-fat ones with the same calorie intake in weight loss, improving anthropometric parameters, glucose and lipid status, and other metabolic markers.

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## T3:PS.112

## Relations between obesity and hypertension in adolescents

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**Background and aim:** In concert with the increasing prevalence of childhood obesity, evidence suggests that pediatric hypertension may also have become more prevalent than previously reported. The aim of our study was to record the prevalence of obesity and hypertension in adolescents in a rural Greek region and to investigate the effect of obesity on blood pressure (BP) distribution.

**Methods:** The study included 854 students [13.94±0.13 years old, Body Mass Index (BMI): 21.96±0.15 Kg/m<sup>2</sup>] attending randomly selected schools. The students were subjected to blood pressure (BP) assessment according to the guidelines of the 4<sup>th</sup> Report on the Diagnosis, Evaluation and Treatment of High Blood pressure in children and adolescents.

**Results:** Overall prevalence of overweight and obesity was 23.7% and 9.1% respectively, whereas for prehypertension and hypertension the respective percentages were 19.1% and 11.9%. In multiple regression analysis, systolic BP (SBP) was associated with BMI (p<0.001), age (p<0.001) and male gender (p=0.004), while diastolic BP (DBP) correlated only with BMI (p<0.001). The prevalence of hypertension was 27.2% in overweight and 43.6% in obese adolescents, both higher compared to the 2.3% in normal BMI students (p<0.05).

**Conclusion:** BMI seems to be the main determinant of high BP distribution in adolescents and taking into account the upward trend in the rates of childhood obesity, accompanying BP elevations should be anticipated.

## T3:PS.114

## Oxidative stress in overweight women with metabolic syndrome

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**Aim:** To evaluate the relationship of Oxidative Stress (OS) with the association between Metabolic Syndrome (MSy) and overweight in adult women.

**Subjects and Methods:** 365 women aged 18-73y classified according the presence of MSy (APT III criteria) and BMI were studied. Three groups of similar mean age were compared: 143 normal-weights (BMI 18.5-24.9) without MSy, 166 overweight women (BMI≥25) without MSy and 56 overweight women with MSy. Total cholesterol, HDL cholesterol, LDL cholesterol, triglycerides, insulin, glucose, reduced glutathione (GSH), thiobarbituric acid-reactive substances (TBARS), conjugated dienes (CD) and lipid hydroperoxides (LPOH) as well as enzymatic activity of Superoxide dismutase (SOD), Catalase (CAT), Glutathione-S-transferase (GST) and Glutathione peroxidase were measured in an overnight fasting blood sample.

**Results:** Overweight women with MSy presented significantly higher concentrations of CD and lower enzymatic activity of GSH than normal-weight or overweight women without MSy as shown in table.

	Normal-weight mean (SD)	Overweight no MSy mean (SD)	Overweight with MSy mean (SD)
Age	41.1(12.8)	42.4 (12.9)	44.4 (9.2)
GSH <sup>***</sup>	7.3 (1.5)	7.04 (1.7)	6.8 (1.5)
GPX	19.2 (10.0)	18.1 (9.0)	17.2 (9.8)
GST	3.7 (1.8)	4.0 (1.8)	3.8 (1.9)
SOD	597.1 (248.8)	547.1 (190.8)	534.3 (219.3)
CAT	18.8 (4.7)	20.1 (4.4)	18.9 (4.5)
CD <sup>****</sup>	105.0 (42.4)	116.9 (35.6)	127.1 (45.7)
TBARS	0.85 (0.47)	0.94 (0.41)	0.9 (0.3)
HPT	7.9 (5.2)	7.6 (4.4)	8.0 (4.3)

\*p<0.05, \*\*p<0.001, \*\*\*\*p<0.0001

**Conclusion:** The results support the hypothesis that the association of overweight and MSy in adult women impose a high risk of oxidative stress.

## T3:PS.115

## Obesity and prehypertension

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**Introduction:** Obesity and hypertension are well defined and there are important risk factors for cardiovascular disease. The prevalence of hypertension in obesity well known, but the prevalence of prehypertension in obesity not well known.

**Patients and method:** We studied 20499 Hungarian policemen (no treated for hypertension) 18543 men, age 18-61 y. The prehypertension was defined as a systolic blood pressure of 120 to 139 mmHg or a diastolic blood pressure of 80-89 mm Hg. We measured the BMI, the waist, and the hip circumferences and we calculated the WHR.

**Results:** We found 11685 subjects with prehypertension (57.00%). The distribution of prehypertension by gender was: 56.82% men and 58.37% women of the total subjects. The systolic BP was 124.14±5.74 mmHg, the diastolic BP was 77.93±5.89 mmHg. The mean BMI among prehypertensive was 25.70±3.63 kg/m<sup>2</sup>. The prevalence of obesity (BMI≥30 kg/m<sup>2</sup>) was observed among 12.1% of cases of prehypertension. The prevalence of overweight (BMI=25-29.9 kg/m<sup>2</sup>) was 42.38%, the normal weight (BMI=18.5-24.9 kg/m<sup>2</sup>) was 44.53% and the underweight (BMI<18.49 kg/m<sup>2</sup>) was 0.99% in prehypertension. The BMI (p<0.0001), waist (p<0.0001) and hip (p<0.0001) circumference and W/H ratio (p<0.0001) correlated significantly with systolic and diastolic BP.

**Conclusion:** Our findings showed significant prevalence of prehypertension in this "normal" population. The majority of prehypertensive subjects had abnormal BMI. The continuous nature of the relationship between BP and cardiovascular disease, most BP-associated cardiovascular complications occur in individuals with prehypertension. First lifestyle changes and close follow up are recommended in all patient with prehypertension.

## T3:PS.117

## Naringenin chalcone inhibits the expression of inflammatory properties in obesity

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Obesity is recognized as a risk factor for insulin resistance, type II diabetes, and several types of cancer. Recent studies have demonstrated that obese adipose tissue is characterized by increased infiltration of macrophages. It is considered that the paracrine loop involving monocyte chemoattractant protein (MCP)-1 and tumor necrosis factor (TNF)- $\alpha$  between adipocytes and macrophages establishes a vicious cycle that augments the inflammatory changes in obese adipose tissue. Polyphenols, which are widely distributed in fruit and vegetables, are reported to have anti-inflammatory properties. We investigated the effects of naringenin chalcone, one of the major flavonoids in tomato peels, on the production of proinflammatory mediators in lipopolysaccharide (LPS)-stimulated macrophages and in the interaction between adipocytes and macrophages. Naringenin chalcone significantly suppressed the production of MCP-1, TNF- $\alpha$ , and nitric oxide (NO) by LPS-stimulated RAW264 macrophages. Coculture of 3T3-L1 adipocytes and RAW264 macrophages markedly enhanced the production of MCP-1, TNF- $\alpha$ , and NO; however, treatment with naringenin chalcone inhibited the production of these inflammatory mediators. These data indicate that naringenin chalcone exhibits anti-inflammatory properties by suppressing the production of inflammatory cytokines in the interaction between adipocytes and macrophages. The anti-inflammatory properties of naringenin chalcone may be useful for ameliorating the inflammatory change in obese adipose tissue. Research relating to this abstract was funded by Research and Development Program for New Bio-industry Initiatives.

## T3:PS.116

 $G\alpha_z$  G-protein is involved in mechanism of insulin resistance in adipose tissue of rats with monosodium glutamate-induced obesity.

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Early postnatal administration of monosodium glutamate (MSG) to rats induces obesity and insulin resistance in adulthood. In our previous studies we found lower number of insulin receptors in adipocyte plasma membranes, lower total protein content of GLUT4 in adipose tissue cell membranes and lower stimulation of glucose transport by insulin in isolated adipocytes of obese MSG rats. In order to test the potential role of inhibitory G-proteins in mechanisms of insulin resistance in adipose tissue of obese animals we determined the content of  $G\alpha_i$  and  $G\alpha_z$  proteins and an extent of protein tyrosine phosphorylation in epididymal fat tissue cell membranes using immunoblot. MSG obese rats displayed adipose tissue hypertrophy, elevated levels of insulin, leptin, reduced level of IGF-1 and slightly elevated serum glucose. We found significantly decreased protein content of  $G\alpha_z$  in adipose tissue plasma membranes of MSG rats. This was in accordance with lower protein tyrosine phosphorylation noticed in adipose tissue cell membranes of MSG animals. Our results confirm the role of  $G\alpha_z$  in development of insulin resistance by crosstalk between the reduced level of inhibitory G-protein and insulin receptor mediated most likely by activation of phosphotyrosine protein dephosphorylation. Research relating to this abstract was funded by Grant VEGA 2/0162/08.

## T3:PS.118

## Obesity and alanine aminotransferase are associated with metabolic syndrome in patients with ultrasonographic fatty liver

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**Objective:** Nonalcoholic fatty liver disease (NAFLD) and alcoholic fatty liver disease (AFLD) have been associated with metabolic syndrome (MS). The aim of this study was to determine the effect of risk factors of MS in ultrasonographic fatty liver.

**Methods:** A total of 462 adult patients participated in this study. Fatty liver was diagnosed by ultrasonography. There were 189 cases of control (without fatty liver) and 273 cases of ultrasonographic fatty liver (USFL). USFL was consist of NAFLD (n=191) and AFLD (n=75). Criteria of MS were defined according to NCEP-ATP III criteria with a modified waist circumference cutoff (men > 90 cm; women > 85 cm).

**Results:** Heavy drinking, smoking, inactivity, obesity, central obesity, blood pressure, triglyceride, high-density lipoprotein cholesterol (HDL-C), aspartate aminotransferase (AST), alanine aminotransferase (ALT) and gamma-glutamyl transpeptidase (GGT) levels of USFL were significantly higher than those of control (P<0.05). Obesity, central obesity, heavy drink, smoke, and inactivity were significantly associated with fatty liver. Obesity (BMI≥25) and ALT>35 (upper normal limit) were associated with MS in USFL after adjustment of various variables such as above. Odds ratios of obesity and ALT were 3.76 (95% CI 1.10-12.82) and 6.56 (95% CI 1.71-25.06), respectively. Predictive value positive (PVP) of 'USFL', 'USFL+obesity', and 'USFL+obesity+ALT' for MS were 16.1%, 27.2% and 35.0%, respectively in NAFLD. PVP of 'USFL', 'USFL+obesity', and 'USFL+obesity+ALT' for MS were 24.3%, 35.7%, and 52.9%, respectively in AFLD.

**Conclusions:** Obesity and ALT are associated with MS in patients with ultrasonographic fatty liver.

## T3:PS.119

**Relationship between score risk and postprandial response of selected proinflammatory chemokine and adhesive molecule in metabolic syndrome**

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**Introduction:** Metabolic syndrome (MS) is a problem of more than 20% of adult Western population. MS has been regarded as important cardiovascular risk factor. The association between atherosclerosis and chronic inflammatory state is well documented.

The aim of the study was to evaluate relationship between SCORE risk and fasting and postprandial concentrations of selected inflammatory, proatherogenic chemokine serum levels: monocyte chemoattractant protein MCP-1, E-selectin and intracellular adhesive molecule -ICAM in MS patients.

**Materials and methods:** 75 patients (32 men, 43 women, mean age 40,4±12,7 yrs) with MS from Outpatient Clinic for Metabolic Disorders were studied. Criteria to diagnose MS according to ATP III were fulfilled in all patients. SCORE risk was calculated (ESC 2007). Fasting, postprandial (3-hour oral lipid tolerance test) MCP-1, E-selectin and ICAM concentrations were determined (ELISA). 3-hour areas under the curve (AUC) were estimated.

**Results:** Positive correlation between SCORE result and BMI, both systolic and diastolic blood pressure, were found in studied patients. We also found significant positive association between fasting MCP-1, ICAM, E-selectin concentrations, ICAM, E-selectin 3-hour postprandial AUC's and SCORE risk.

**Conclusions:** In metabolic syndrome SCORE reflects risk related to increased body weight and elevated blood pressure. Positive relationship between SCORE risk and increased fasting and exaggerated acute postprandial response of selected chemokine and adhesive molecule concentrations has been found. Elevated pro-inflammatory response may be partly responsible for increased cardiovascular risk in metabolic syndrome.

## T3:PS.121

**Obesity in chronic hepatitis C**Rusu E<sup>1,2</sup>, Marin A<sup>1</sup>, Dragomir A.D<sup>1,2</sup>, Radulian G<sup>1,2</sup>, Vladica M<sup>2</sup>, Cheta D.M<sup>1,2</sup>,<sup>1</sup>Diabetes and Nutrition, University of Medicine "Carol Davila", Bucharest, Romania<sup>2</sup>Diabetes, Institute of Diabetes, Nutrition and Metabolic Disorders "Prof. Nicolae Paulescu", Bucharest, Romania,

**Background and Aims:** Several noninvasive markers are being used to assess the structural liver damage in patients with chronic hepatitis C (CHC). The objective of this study is to evaluate the correlations between obesity and noninvasive serum markers in patients with diabetes mellitus type 2 (DM) and chronic hepatitis C.

**Materials and Methods:** Was selected 115 patients and divided in 2 groups: group A, 58 patients with type 2 diabetes mellitus and chronic hepatitis C, and group B, 57 patients with type 2 diabetes mellitus and nonalcoholic steatohepatitis (NASH). The following parameters were observed: body mass index (BMI), HbA1c, hepatic profile, lipid profile, hematological profile. Noninvasive markers such aspartate aminotransferase (AST)/ alanin aminotransferase (ALT) ratio, the AST to platelet ratio index (APRI) and -glutamyltransferase (GGT) were evaluated.

**Results:** The average age was 60.2±9.87 in group A and 57.73±7.9 in group B. Obesity was present in 31.03% patients with CHC, and 61.4% with NASH. BMI value was bigger in steatohepatitis group than in patients with diabetes and hepatitis C (30.52±7.64 vs 27.6±4.36 p=0.01). The cytolytic syndrome was more important in patients with obesity in both groups (AST 61.56±58.02 vs 33.14±24.47 p=0.0001, and ALT 74.00±59.64 vs 39.82±31.9 p=0.0003). Higher BMI was correlated with APRI and GGT, but not with AST/ALT ratio. Lipid profile, suggesting dyslipidemia was more frequent in obese patients. AST/ALT ratio and APRI was correlated with triglycerides and HDL-cholesterol but not with cholesterol, in patients with CHC.

**Conclusion:** Obesity and associated metabolic abnormalities play a role in the progression of liver disease.

## T3:PS.120

**The oxidative stress parameters at type 2 obese diabetic patients**Onaca A<sup>1</sup>, Onaca M<sup>1</sup>, Erdei A<sup>2</sup>, Chis R<sup>2</sup>University of Oradea faculty of medicine and pharmacy  
Clinical hospital of Oradea

**Objectives:** The present study is supposed to monitor the oxidative stress parameters at obese diabetic patients vs. the non-diabetics and the correlation between the intensity of the oxidative stress and the degree of obesity, metabolic control and the presence of insulin resistance.

**Material and method:** We included in the study a number of 180 patients with type 2 diabetes, out of whom 120 were obese while the other 60 were non obese patients. We studied the oxidative stress parameters: the pro-oxidant activity was evaluated by dosing the malonic dialdehyde produced by the lipid peroxide and by the carbonylated proteins which resulted from the oxidation of the proteic structures, while the antioxidant activity was evaluated through the dosing of ceruloplasmine. To each patient we looked for the followings: weight, abdominal circumference, BMI, duration of diabetes evolution, the degree of metabolic control, insulinemia, the HOMA index.

**Results:** The obese diabetic patients presented increased values of malonic dialdehyde and of the carbonylated proteins, as well as decreased ranges of antioxidants agents (ceruloplasmine).

	Type 2 obese diabetes	Type 2 non obese diabetes
Malonic dialdehyde (nmol/mg)	4,2+/-0,83	2,94+/- 0,46
Carbonylated proteins (nmol/mg)	2,45+/-0,11	1,92+/-0,09
Ceruloplasmine (mg%)	24,5+/-0,95	29,45+/-0,87

**Conclusions:**

- Diabetics with a severe obesity degree present an intensified activity of the prooxidant agents.
- The oxidative stress is more increased, the more the metabolic disorder of diabetics is higher
- The presence of hyper insulinism and of insulin resistance has a positive correlation to the intensification of the oxidative stress.

## T3:PS.122

**Prevalence of obesity and metabolic syndrome in adolescent girls in South East of Iran - 2007**Salem Z<sup>1</sup>, Vazirinejad R<sup>2</sup><sup>1,2</sup> Social Medicine Department, Medical School, Rafsanjan, Iran

**Background and Purpose:** Obesity is the most common cause of insulin resistance and metabolic syndrome (MS). These are the most important risk factors for CHD. The present study aims to evaluate Prevalence of obesity and metabolic syndrome in adolescents girls in south East of Iran (Rafsanjan).

**Material & Methods:** In this descriptive study 1221 respondents were randomly selected using a multiphase sampling method. The individual questionnaire was completed after receiving a written consent form. The weight, height, waist circumference (WC) and blood pressure were measured using standard equipments. Sample of blood were drawn for measuring TG, HDL CHO and FBS of the obese volunteer after detecting obese subjects. We determined MS according to the ATP3 criteria. Data were analyzed using SPSS 12

**Results:** Mean age of respondents was 14.3 ± 1.7 years, and 11.2 % and 2.4 % of subjects were overweight and obese respectively. According to our findings about 1.2 % respondents had abdominal obesity. According ATP3 criteria 3.9 % of respondents had MS. we showed that 3.9 % of subjects had at least three risk factors together.

**Conclusions:** Our findings showed that overweight, obesity and MS are common health problem in Rafsanjan. we suggest using educational programs and increased physical activity could reduce these risk factors. These programs will develop nutritional attitude in youth girls. Omitting Subside of high energy food include sugar, fat and rice is also suggested.

**Key Words:** Metabolic Syndrome, Obesity, Adolescent girls, Rafsanjan

## T3:PS.123

**Influence of obesity on distribution of local pressures of shod child's foot**Sixtová, P<sup>1</sup>, Hlaváček, P<sup>1</sup>, Pavlačzková, J<sup>1</sup>, Šimoňáková, L<sup>1</sup>, Janušková, P<sup>1</sup><sup>1</sup> Tomas Bata University in Zlín, Czech Republic

**Introduction:** Our experiment has been aimed on the study of the obesity influence on distribution of local pressures of the child's shod obese and non obese foot.

**Methodology:** At the beginning of 2007, measurement of the feet of younger school children has been performed. On the basis of the BMI index, 40 boys and 40 girls have been divided into 4 weight groups. Local pressures between the foot and the sock lining by walking have been assessed with the PEDAR system. For processing the data measured, the shoe insole has been divided into 4 masks (heel, outer and inner longitudinal arch and metatarsal). In individual masks, maximum strength, maximum pressure and average pressure have been measured and difference of these values depending on the weight category of subjects have been monitored.

**Evaluation:** When evaluating the tread forces between the foot and the shoe insole, the highest average value of the maximum strength and of the maximum pressure has been found in the metatarsal region and in the heel region. The values of the average pressure have shown that the foot of the subjects of all weight categories has been loaded in the way which corresponds with the anatomical step. With all variables monitored there have been ascertained increasing values of the variables monitored with increasing the body weight of the subjects.

**Conclusion:** The child's foot should not be limited in its development that is why possible design modifications of footwear for the child's obese population could be solved.

## T3:PS.125

**Fish oil improves insulin resistance induced by the physical stress in obese KKAY mice.**

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Stress is a cause of lifestyle-related diseases and the reduction of the harmful effects of stress is very important. Our previous study indicated that fish oil improved insulin resistance induced by the physical stress in lean C57BL/6J mice. Therefore, we investigated the effect of fish oil on insulin resistance and a lipoperoxidation under the physical stress in obese KKAY mice.

Female mice divided into four groups were fed the each diet containing 10 or 30 energy % as lard (Lard 10%, Lard 30%) or fish oil (Fish 10%, Fish 30%). In addition, each group was divided into two groups by absence or presence of the stress induced by electric shock. Mice were given each diet for 6 weeks, in the last 2 weeks of experiments, mice of stress groups were exposed to the stress.

In Lard 10% and 30%, the stress suppressed plasma insulin levels and elevated fasting plasma glucose (FPG) levels. By contrast, in Fish 10% and 30%, the stress elevated plasma insulin levels and did not change FPG. However, as induction of obesity independent of the stress, plasma adiponectin levels and anti-oxidant abilities were decreased, and TBARS in liver and WAT were not changed in all groups.

These results suggest that the obesity itself is strong cause of induction of insulin resistance and reduction of antioxidant ability with or without physical stress, and fish oil improves insulin resistance induced by the physical stress in obese mice as well as lean mice.

## T3:PS.124

**Prevalence of the metabolic syndrome in prediabetes and in newly-diagnosed type 2 diabetes**Tankova, T, Chakarova, N, Lazarova, M, Atanasova, <sup>1</sup>

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The aim of the present study is to evaluate the prevalence of the metabolic syndrome in subjects with prediabetes - impaired fasting glucose (IFG) and impaired glucose tolerance (IGT) and in newly-diagnosed type 2 diabetic patients.

**Material and methods:** 229 subjects with prediabetes - 122 with IFG and 107 with IGT, of mean age 54.45±11.1 years as well as 232 age- and sex-matched newly-diagnosed type 2 diabetic patients were enrolled. Glucose tolerance was studied during OGTT. Plasma glucose was measured by a dehydrogenase method; serum lipids were assessed using enzyme-colorimetric tests. Categories of glucose tolerance were defined according to 2006 WHO criteria. The IDF 2005 definition of the metabolic syndrome was used.

**Results:** The metabolic syndrome was present in 85.25% of IFG subjects, in 82.24% of IGT subjects and in 86.67% of newly-diagnosed diabetic patients. The mean number of elements of the metabolic syndrome was 3.8±0.65 in IFG, 3.95±0.73 in IGT and 4.1±0.76 in diabetes (p=0.0003 vs IFG). In males the metabolic syndrome was most prevalent in IFG group, while in females - in newly-diagnosed diabetes. BMI was similar in the three groups while waist circumference was significantly higher in both males and females with diabetes as compared to IFG and IGT.

**Conclusions:** The prevalence of the metabolic syndrome in prediabetes - IFG and IGT, is rather high, being similar to that in newly-diagnosed type 2 diabetes. Therefore IFG and IGT should be considered not just as conditions of altered glucose metabolism but also in relation to their association with cardiovascular risk factors.

## T3:PS.126

**The association between polymorphisms in ace, atr1, enos and insulin genes and obesity in romanian patients**Apostol P<sup>1</sup>, Cimponeriu D<sup>1</sup>, Panaite C<sup>2</sup>, Toma M<sup>1</sup>, Stavarachi M<sup>1</sup>, Gavrila L<sup>1</sup>, Cheta D<sup>2</sup>.<sup>1</sup>Genetics Institute, Bucharest University<sup>2</sup>N. Paulescu Institute of Diabetes, Nutrition and Metabolic Diseases

Obesity, insulin resistance and hypertension coexist and represent risk factors for an unfavorable outcome. The genetic component of these complex phenotypes is partially overlapped. Common points may be represented by the genes involved in regulation of blood pressure or in insulin signaling pathway.

**Aim:** to study the relationship between four polymorphisms and obesity in Romanian population.

**Materials and methods:** Clinical data and blood samples were collected from 150 unrelated obese patients. We selected healthy subjects (n=150) with normal BMI (<25 Kg/m<sup>2</sup>) as a control group matched for sex, age and Romanian Caucasian ethnicity. All four polymorphisms were genotyped using PCR based methods.

**Results:** The distribution of genotypes for all polymorphisms is in Hardy-Weinberg equilibrium. The frequency of alleles is in the range reported for others Caucasians populations. Our results do not sustain the association between obesity and polymorphisms in ACE ID, ATR1 A1166C, eNOS ID and Insulin +1127 Pst. A trend of association has been observed regarding the distribution of Insulin +1127 Pst polymorphism (chi square=2.2)

**Conclusion:** The present study, performed in relative small groups, showed that ACE ID, ATR1, eNOS ID are not a important contributors to obesity, while insulin +1127 Pst polymorphism could present a weak association with obesity in Romanian patients.

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## T3:PS.127

**Impaired insulin secretion and uptake might be involved in development of diffuse idiopathic skeletal hyperostosis.**Baculikova, M<sup>1</sup>, Zlnay, D<sup>2</sup>, Zorad, S<sup>1</sup><sup>1</sup>Institute of Experimental Endocrinology, Slovak Academy of Sciences, Bratislava, Slovakia<sup>2</sup>National Institute for Rheumatic Diseases, Piestany, Slovakia

Diffuse idiopathic skeletal hyperostosis (DISH) is characterized by calcification and ossification of ligaments. The pathogenesis of DISH is not fully understood but several factors have been implicated in the disease based on frequent associations with various metabolic conditions such as obesity, diabetes and dyslipidemia.

It is not clear whether metabolic disturbances accompanying DISH originate directly from the disease or reflect conditions arising from high prevalence of obesity and insulin resistance in DISH patients. Therefore, we compared non-diabetic DISH patients with a group of age and body weight-matched controls. Both groups were subjected to oral glucose tolerance test and serum levels of glucose, insulin, C-peptide, growth hormone, IGF-1, IGF-BP3, total cholesterol, HDL cholesterol, triglycerides, non-esterified fatty acids (NEFA) and uric acid were determined. The indices of insulin sensitivity and insulin secretion were calculated. We found only reduced insulinogenic index and insulin/C-peptide ratio in DISH suggesting decreased insulin secretion (IS) and increased uptake of insulin. Reduced IS is in accordance with lower levels of NEFA, as a stimulator of IS, in DISH patients. We assume that reduced insulin secretion and increased insulin uptake in tissues might be a clue in elucidation of DISH pathogenesis.

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## T3:PS.129

**Analysis of body fat mass in patients with metabolic syndrome**Dragomir, A<sup>1</sup>, Radulian, G<sup>1,2</sup>, Rusu, E<sup>1,2</sup><sup>1</sup>“N. Paulescu” National Institute of Diabetes, Nutrition and Metabolic Diseases, Bucharest, Romania<sup>2</sup>University of Medicine “Carol Davila”, Buharest, Romania

**Objectives:** To compare body mass index (BMI), waist circumference, waist-to-hip ratio (WHR) and body fat mass (BFM) as indices of obesity and assess the respective associations with metabolic syndrome.

**Material and methods:** 75 patients, 47 females and 28 males, aged 52 ± 7 years, with metabolic syndrome according to IDF definition were included in the study. BMI > 30 kg/m<sup>2</sup> was used as criteria for determining obese patients. BFM and body fat percent (%BF) were measured using bioimpedance analysis (BIA). The normal range of %BF for men was 15 ± 5% and 23 ± 5% for women.

**Results:** Central obesity was present in all patients as a condition for IDF definition of metabolic syndrome. Their mean BMI was 33.12 kg/m<sup>2</sup>, mean %BF 35.26, mean BFM 31.39 kg, and mean WHR 1.17, while mean waist circumference was 108 cm in men and 99 cm in women. BMI was statistically correlated with BFM (p<0.0001) and %BF (p<0.0001). More severe values of hypertension, dyslipidemia and glucose were correlated with high values of WHR (>0.95), %BF (>30%) and BFM. Fitness score was measured, expressing the status of body composition. A score less than 70% means “weakness”, while greater than 90 means “athletic body type”. Mean value of the subjects was 71.1.

**Conclusions:** Waist-to-hip ratio, body fat percent and body fat mass proved to be more helpful than waist circumference and BMI in assessing health risk in patients with metabolic syndrome.

## T3:PS.128

**Omega-6 fatty acids-rich diets decrease liver mitochondrial efficiency during refeeding after caloric restriction in rat**Crescenzo, R<sup>1</sup>, Bianco, F<sup>1</sup>, Falcone, I<sup>1</sup>, Yepuri, G<sup>2</sup>, Dulloo, AG<sup>2</sup>, Liverini, G<sup>1</sup>, Iossa, S<sup>1</sup>.<sup>1</sup>University of Naples “Federico II”, Naples, Italy<sup>2</sup>University of Fribourg, Fribourg, Switzerland

Catch-up growth - a risk for later obesity and type 2 diabetes - is characterized by a higher rate of fat relative to lean tissue deposition. Using a rat model of refeeding after semistarvation, such catch-up fat has been shown to be primarily driven by suppressed thermogenesis and to be exacerbated by high-fat diets rich in animal (saturated) fats. This latter exacerbation of catch-up fat is however not observed with safflower oil - which is rich in omega-6 polyunsaturated fatty acids; these anti-obesity effects being explained partly by a higher lean tissue deposition and partly by enhanced thermogenesis. We investigated here the role of altered liver mitochondrial energy coupling and relative oxidative stress (assessed as SOD specific activity) in such dietary modulation of catch-up fat.

After 14 days of semistarvation, male Sprague-Dawley rats were refed for 7 days with isocaloric amounts of either a low-fat diet, a high-fat lard diet or high-fat safflower oil diet. Compared to the group refed the high-fat lard diet, the rats refed isocalorically on high-fat safflower oil diet gained less body fat but more body protein, and their isolated liver mitochondria showed increased proton leak (basal and palmitate-induced) and decreased oxidative stress.

Thus the exaggerated suppression of thermogenesis that exacerbates catch-up fat on high-fat diets is counteracted by a diet rich in omega-6 fatty acids, in part by a shift in energy partitioning from body fat to protein, and in part via increased thermogenesis resulting from increased hepatic mitochondrial proton leak and decreased mitochondrial efficiency.

## T3:PS.130

**Effect of conjugated linoleic acid (CLA) on endothelial function and traits of the metabolic syndrome**Fielitz, K<sup>1,2</sup>, Helwig, U<sup>1</sup>, Pfeuffer, M<sup>1</sup>, Winkler, P<sup>1</sup>, Laue, C<sup>2</sup>, Schwedhelm, E<sup>3</sup>, Böger, RH<sup>1</sup>, Bell, D<sup>4</sup>, Schrezenmeir, J<sup>1</sup>Institute of Physiology of Nutrition, Federal Research Centre for Nutrition and Food (BfEL), Kiel, Germany<sup>2</sup>tecura GmbH, Kiel, Germany<sup>3</sup>Institute for Experimental & Clinical Pharmacology & Toxicology, University Medical Center Hamburg-Eppendorf, Germany<sup>4</sup>Cognis GmbH, Monheim, Germany

CLA affects several parameters of the metabolic syndrome, e.g. body composition, particularly shown in animals. Results of human studies were inconsistent. This may be explained by different fats used as control (mostly olive oil), differing study duration and dose of supplements. Moreover, the content of anti-oxidative substances in preparations used was not standardized. Therefore, following study aimed at investigating the effect of CLA on endothelial function and metabolic risk factors compared to control oils adjusted to identical vitamin E contents.

In a double-blind, controlled, parallel trial 81 men of the Metabolic Intervention Cohort Kiel were randomized to 4.5g/d CLA isomeric mixture (Tonalin™) or 1 of 3 control fats. Endothelial function was measured using finger pulse waves (PAT) fasting and after a mixed meal (Oral Metabolic Tolerance Test, OMTT). Blood samples were taken before and 9h following OMTT before and after intervention.

Fasting PAT remained unaltered with CLA, postprandial PAT was improved significantly versus olive oil. Body weight was significantly reduced with CLA as compared to all other fats. Moreover, fasting glucose and diastolic blood pressure decreased with CLA as compared to oxidized safflower oil, total and LDL cholesterol decreased within the CLA group (p < 0.05). Systolic blood pressure decreased within the CLA and native safflower group (each p < 0.01). Isoprostanes were increased with CLA treatment.

CLA beneficially modified several cardiovascular risk factors. Endothelial function wasn't changed in the fasting state and improved postprandially by CLA as compared to olive oil. Biological relevance of F2-isoprostanes needs to be examined.

## T3:PS.132

## Metabolic Consequences of Obesity in Georgian Children and Adolescents

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**Objectives:** Obesity in childhood and adolescence increases the risk of the insulin resistance syndrome (IRS) and cardiovascular mortality in adult life. The aim of the study was: to evaluate the prevalence of the IRS in Caucasian obese children and adolescents.

**Materials and Methodology:** We selected 102 obese Caucasian children and adolescents with no other diseases or treatment affecting body composition. 52 were males, 50 -females; mean age was 10.3 years. Body Mass Index (BMI) was  $\geq 95^{\text{th}}$  percentile. Information on height, weight, waist and hip circumferences, Tanner staging, diet, physical activity, and birth weight, family history of obesity, diabetes, and CVD was collected. BP, OGTT and baseline plasma insulin were measured.

**Results:** At birth 85% of the participants had normal weight and 5% had lower than normal weight. There was no difference in the prevalence of obesity among boys and girls in pre pubertal stage; in pubertal stage obesity was more common among girls (10.3% vs. 7.8%,  $p < 0.05$ ). Abnormal glucose homeostasis was found in 34%, dyslipidemia in 43% and hypertension in 8% of the participants. 30% had only obesity, 43% had two IRS components, 24% had three and 3% had four IRS components. Positive family history for CVD and/or DM was noted in 36%.

**Conclusions:** 27% of the children had three and more characteristics of IRS. This group of children are undergoing complex weight loss control program with individualized diet and therapeutical lifestyle modification. We plan to keep on monitoring the IRS components in these children along with weight loss program and physical growth.

## T3:PS.134

## Dehydroabiatic acid, a dual agonist of peroxisome proliferator-activated receptors alpha/gamma, suppresses the inflammatory responses of macrophages and adipocytes

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Obesity is characterized by an increased infiltration of macrophages to adipose tissue, which is closely associated with the low-grade inflammatory state and obesity-related pathologies such as type 2 diabetes and cardiovascular diseases. Monocyte chemoattractant protein (MCP)-1, a member of the CC chemokine suprefamily, plays a crucial role in adipose tissue inflammatory responses by inducing the infiltration of macrophages. Therefore, it is important to decrease the production of MCP-1 to prevent obesity-related inflammation. Abietic acid (AA), a major component of the rosin fraction of conifer species, has been reported to have anti-inflammatory properties partly via activating peroxisome proliferator-activated receptor (PPAR) gamma. On the other hand, the efficacy of many AA derivatives including dehydroabiatic acid (DAA), which is also contained in conifer, has not been well studied. Using a sensitive screening system for PPAR ligands, we showed that DAA is the most potent dual activator of PPAR alpha and gamma. Furthermore, we examined the effect of DAA on the inflammatory changes in lipopolysaccharide (LPS)-stimulated macrophages and in the interaction between macrophages and adipocytes. DAA significantly suppressed the production of pro-inflammatory mediators such as MCP-1, tumor necrosis factor-alpha, and nitric oxide in LPS-stimulated RAW 264 macrophages and in the coculture of RAW 264 macrophages and 3T3-L1 adipocytes. These results suggest a novel possibility that DAA, natural PPARs agonist, can be a valuable medicinal and food component for improving the inflammatory changes associated with obesity-related diabetes.

## T3:PS.133

## Rapid effect of repaglinide in combination with metformin in poorly controlled obese patients with type 2 diabetes mellitus

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**Background and aims:** Combination of drugs, affecting early insulin secretion and peripheral insulin resistance are a good therapeutic option for patients (pts) with type 2 diabetes mellitus (T2DM). The aim of the present work was to compare efficacy of Repaglinide+Metformin and Sulphonylurea+Metformin in obese T2DM pts.

**Materials and methods:** A total of 107 pts with T2DM not well-controlled on monotherapy. Repaglinide - naïve were allocated into 2 groups (Gr.): Gr.1 (n= 65) – Repaglinide 1mg/meal and Metformin 1000mg twice/daily. Gr.2 (n=42) - Glimperidre 4mg/breakfast and Metformin1000mg twice/daily. At entry following data were obtained for Gr.1 and Gr.2, respectively: age -56.9± 9.7 and 54.6± 6.9yrs; diabetes duration - 4.18± 2.06 and 4.04 ±3.1yrs; BMI -28.9± 5.3 and 29.1± 4.9kg/m<sup>2</sup>; HbA1c -10.43± 2.46 and 9.72 ±2.72 %; fasting glycemia (FG) -195.5± 59.5 and 158.3± 83.2mg/dl; postprandial glycemia (PG) - 285.6±91.17 and 220.1± 91.64mg/dl. Pts were supervised for 3 months.

**Results:** Examinations at month 3 post treatment initiation revealed: BMI decreased to 26.1 ± 4.2kg/m<sup>2</sup>; P=0.001 (Gr.1) and 28.8±5.1 kg/m<sup>2</sup>; P=0.784 (Gr.2); HbA1c dropped to 6.94±1.11 %; P= 0.000 (Gr.1) and 7.99 ± 1.46%; P=0.000 (Gr.2). HbA1c values decreased by 3.49±1.35% (Gr.1) and 1.73± 1.26% (Gr.2). FG decreased to 114.6 ± 19.7mg/dl; P=0.000 (Gr.1) and 138.8±50.2 mg/dl; P=0.197 (Gr.2); PG dropped to 123.3 ±24.18 mg/dl; P=0.000(Gr.1) and 178.6 ± 43.9 mg/dl; P=0.01 (Gr.2). The latter values decreased by 162.3± 66.99 mg/dl (Gr.1) and 41.5± 17.74 mg/dl (Gr.2). Analysis of the data obtained revealed statistically evident positive shifts in BMI, b 1 , FG, PG.

**Conclusion:** These data confirm that Repaglinide+Metformin gives rapid effect in reducing glycemia (FG, PG), HbA1c and BMI indices in T2DM pts.

## T3:PS.135

## Serum adipokines and metabolic syndrome

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**Objective:** The aim of the present study was to determine serum concentrations of adipokines in obese women with and without metabolic syndrome.

**Material and methods:** 101 obese women with and without additional disease (hypertension, type 2 diabetes mellitus, dyslipidemia and coronary heart disease) on the basis of IDF criteria were divided into 2 groups: with metabolic syndrome (n = 67, age 53.4 ± 8.4 y) and without metabolic syndrome (n = 34, age 52.1 ± 10.6 y). Serum concentrations of TNF -  $\alpha$ , sTNFRs, IL-6, leptin, resistin and adiponectin were assayed with ELISA kits. Insulin was determined by radioimmunoassay and glucose by colorimetric method. HOMA was calculated.

## Results:

		with metabolic syndrome	without metabolic syndrome
Body mass	(kg)	100.8± 15.1	92.4 ± 14.4*
BMI	(kg/m <sup>2</sup> )	38.9±5.6	36.0±5.4*
Body fat	(kg)	48.7±6.7	48.2 ± 7.2*
Waist circumference	(cm)	108.4± 17.2	104.7 ± 11.5
Glucose	(mmol/l)	6.5 ± 1.6	5.3 ± 1.0*
Insulin	( $\mu$ IU/ml)	15.8 ± 10.3	10.4 ± 9.8*
HOMA		4.6 ± 3.6	2.7 ± 3.4*
TNF - $\alpha$	(pg/ml)	6.3 ± 2.0	5.9 ± 4.4*
sTNFR1	(pg/ml)	1444.4 ± 516.4	1187.4 ± 470.0*
sTNFR2	(pg/ml)	2218.1 ± 705.1	1841.8 ± 605.5*
IL-6	(pg/ml)	9.5 ± 2.4	11.4 ± 4.4
Resistin	(ng/ml)	16.2±4.6	14.2±3.1
Leptin	(ng/ml)	34.9±15.0	34.1±14.4
Adiponectin	(ng/ml)	10.5±4.2	8.7±2.7

\* p &lt; 0.05

**Conclusion:** Our findings suggest that metabolic syndrome in patients with hypertension, dyslipidaemia, type 2 diabetes mellitus is a cause of TNF system activation. Other adipokines levels did not differ in the study groups.

## T3:PS.136

**The analogue insulinic at obese diabetic patients**Onaca M<sup>1</sup>, Onaca A<sup>1</sup>, Erdei A<sup>2</sup>, Chis R<sup>2</sup>University of oradea faculty of medicine and pharmacy  
Clinical hospital of oradea**Aims:** to research the effect of the insulin therapy over the weight curve and the advantages of the using of insulin analogues.**Method:** The study included a number of 50 obese patients with type 2 diabetes, to who we initiated the intensive insulinic therapy. We created 2 plots: one of 25 patients who were treated with human insulin, and the second one of 25 patients who were treated with insulinic analogues. During an interval of 6 months, the patients were monitored the metabolic control, body weight and the side effects.**Results:** At initializing of the study, the patients had an average Hb A1c of 10.5%, while after 6 months of therapy the patients out of the first plot ranged a Hb A1c value of 8.6% vs. the second plot with a range of 7.2%. The frequency rate of hypoglycemic episodes was of 28%, and of the severe episodes was with 46% less than the one of the patients' out of the second plot who were treated with insulinic analogues. The patient's weight increase was smaller in the second batch. They presented an average increase of 2.3 kg within 6 months, while the patients who were treated with human insulin had an average increase of 3.8 kg.**Conclusions:** The use of insulin analogues in the therapy of obese diabetic patients ensures a great benefit, as it allows a good metabolic control with the price of a lower hypoglycemic risk and a reduced weight increase in comparison to the conventional human insulin.

## T3:PS.138

**Search for the components in fish oil improving insulin sensitivity in mice**Shiba, S<sup>1</sup>, Tsunoda, N<sup>1</sup>, Sonoda, M<sup>2</sup>, Muraki, E<sup>1</sup>, Ikemoto, S<sup>2</sup> and Kasono, K<sup>1</sup><sup>1</sup> Faculty of Pharmaceutical Sciences, Josai University, Saitama, Japan<sup>2</sup> Faculty of Human Life and Environmental Sciences, Ochanomizu University, Tokyo, Japan

Dietary fish oil has been reported to improve peripheral insulin sensitivity and plasma lipid disorders. Fish oil contains various fatty acids such as eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA), antioxidants such as vitamin C and delta-tocopherol, and unknown ones. Therefore, we investigated to clarify the main components in fish oil bringing the improvement of insulin sensitivity.

C57BL/6J female mice divided into 4 groups were fed the each diet (40% of fat energy); 1) fish oil diet containing antioxidants (FO), 2) extensively hydrogenated fish oil diet (HFO) excluded double bonds of unsaturated fatty acid such as EPA and DHA, 3) fish oil diet containing low amount of antioxidants (FO-low), 4) soybean oil diet (SBO) as a control for 11 wks.

In final body weight, FO, HFO and FO-low significantly decreased compared with SBO, but FO groups were not different. In glucose tolerance tests on 8 wks, SBO tended to show higher blood glucose levels than FO groups, and FO tended to show lower blood glucose levels than that of HFO and FO-low at 15 and 30 minutes after an oral glucose load. In insulin tolerance test on 9 wks, FO tended to show the lowest blood glucose levels in four groups.

These results unexpectedly suggest that the exclusion of EPA and DHA or reduction of antioxidants in fish oil did not affect body weight. However, unsaturated fatty acids and antioxidants may be important to improve insulin sensitivity.

## T3:PS.137

**Serum concentrations of visfatin in obese women with and without metabolic syndrome**

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**Objective:** The aim of the present study was to determine serum concentrations of visfatin in obese women with and without metabolic syndrome.**Material and methods:** 102 obese women on the basis of IDF criteria were divided into 2 groups with metabolic syndrome (n = 68, age 53.4.0 ± 8.4 y, BMI: 38.9 ± 5.6 kg/m<sup>2</sup>) and without metabolic syndrome (n = 34, age 52.1 ± 10.6 y, BMI: 36.0 ± 5.4 kg/m<sup>2</sup>). Body composition was measured by bioimpedance. Serum concentrations of visfatin was assayed with ELISA kit. Insulin and C-peptide were determined by radioimmunoassay and glucose by colorimetric method.**Results:** Serum concentration of visfatin, C peptide and insulin were significantly higher in obese with metabolic syndrome. In all the study subjects positive correlation between visfatin and age was observed. No correlation between visfatin and waist circumference, body and fat mass, glucose, insulin and C-peptide level were detected.

	with metabolic syndrome	without metabolic syndrome
Body mass (kg)	100.4 ± 14.7	93.7 ± 15.2 *
Body fat (kg)	52.3 ± 12.1	49.4 ± 10.3 **
Waist circumference (cm)	108.4 ± 17.2	104.7 ± 11.5
Glucose (mmol/l)	6.5 ± 1.6	5.3 ± 1.0 ***
Insulin (μIU/l)	15.8 ± 10.3	10.3 ± 9.8 ***
HOMA	4.6 ± 3.6	2.7 ± 3.4 ***
C peptide (ng/dl)	1.4 ± 0.7	0.8 ± 0.3 ***
Visfatin (ng/ml)	35.9 ± 12.4	25.9 ± 6.4 ***

\*p &lt; 0.05; p &lt; 0.001; p &lt; 0.00001

**Conclusion:** We observed higher serum concentrations of visfatin in obese women with metabolic syndrome.

## T3:PS.139

**Reflexes of obesity on the distribution of local plantar pressures of the children foot.**Šimoňáková L<sup>1</sup>, Hlaváček P<sup>1</sup>, Pavlačková J<sup>1</sup>, Sixtová P<sup>1</sup>, Janušková P<sup>1</sup><sup>1</sup> Tomas Bata University in Zlín, Czech Republic**Introduction:** Problems of overloading of the children obese foot have not yet been object of any greater attention and, therefore, an experiment has been effected, which elucidates the distribution of local pressures with children of younger school age.**Method:** At the beginning of 2007, measurement has been performed in several elementary schools. In a file there have been selected 40 boys and 40 girls having 8 to 11 years. According to the BMI index, they have been divided into four weight categories. Maximum strength and maximum pressure of bare foot by walking were measured by the Emed platform. The surface of the foot has been divided in the heel region, the central part of the foot (lateral and medial) and the toe.**Evaluation:** It is possible to state, that with the increased weight, the average values of the contact surface and of the maximum strength increase. Maximum values of the maximum strength have been found in the toe region. Moderate increase of the average values of the maximum pressure has been recorded in the toe region and, partially, in the heel region. When comparing all weight categories, it is not possible to explicitly say, if average values of maximum pressure depend on body weight.**Conclusion:** Footwear of obese children should be paid a maximum attention, above all in what concerns the interior room of footwear in its metatarsal region.

## T3:PS.140

**Maternal diets predispose the offspring for obesity, obesity related diseases and environmental toxicity.**

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There is increasing evidence that nutrition of the mother during gestation and/or lactation may increase, in the offspring, the vulnerability for the development of obesity, obesity related diseases and environmental factors. Somewhat conflicting results are reported and precise mechanisms underlying these findings are largely unknown. Most probably, metabolic set-points regulating 'satiety and hunger' and 'energy expenditure' in the offspring are programmed on the basis of the supply and availability of energy during gestation and/or (early) lactation. Abnormalities in these metabolic set-points might predispose the offspring for obesity (and related diseases) and environmental exposure.

In humans, it is difficult to discriminate between prenatal and postnatal phases; animal studies using a cross-fostering design, however, may mimic this to some extent.

In previous studies, Wistar rats (n=28-32) were kept on caloric different diets during 6 weeks prenatally and throughout gestation and lactation. Maternal influences during gestation and lactation were studied separately by cross-fostering the F1-animals immediately after birth. Low-caloric pups fostered to high-caloric dams showed increased growth (catch-up growth) and high-caloric pups fostered to low-caloric dams showed decreased growth. Catch-up growers were more susceptible to environmental exposure (reduced body weight) whereas pups fostered to dams on a caloric restricted diet showed delayed development (landmarks).

Current studies are focused on 1) the metabolic set-points which might be involved in the predisposition for obesity, 2) vulnerability for environmental toxicity with life lasting consequences for development and 3) 'motivation for eating' and 'energy-expenditure'.

The main metabolic set-points under investigation are (disruption of) the insulin status in dams on caloric different diets during gestation and/or lactation and the subsequent induction of glucose intolerance and disturbance of the balance of various hormones regulating hunger and satiety in the (cross-fostered) offspring.

**Funding:** This study was financially supported by Dutch government through grant "Healthy nutrition" (grant number 04003)

## T3:PS.142

**Obesity and other risk factors in adolescents with primary hypertension**

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**Introduction:** The percentage of hypertensive patients among children and youth grows every year. Very often hypertension coexists with obesity (or overweight) and lipids disorders. The aim of this work was to assess how often we meet risk factors such as: positive family history, obesity and dyslipidemia in groups of children and youth with primary hypertension.

**Material and methods:** There were 86 patients under examination, aged 14-17 (50 boys and 36 girls) with primary hypertension. The given parameters were estimated: family history, blood pressure, height, weight, BMI, lipid profile. The control group consisted of 93 healthy subjects matched by sex and age.

**Results:** In the analyzed group 39,53% of fathers and 27% of mothers had hypertension. There were also high percentage of obesity among parents - 24,42% of fathers were obese and 29,07% of mothers. In examined population BMI was significant higher than in control group. Only in groups of 14 year old boys and 17 year old girls, the differences failed to reach the statistically significance. The average systolic blood pressure was the highest in the group of 17 year old boys and girls (145,0 ± 7,79 mmHg and 143,3 ± 8,16 mmHg respectively). The average diastolic blood pressure was the highest in group of 17 years old girls and 15- and 17 year old boys (88,3 ± 9,83 mmHg and 85,0 ± 9,06 mmHg and 85,0 ± 8,02 mmHg respectively). In analyzed group 39,5 % of patients had both hypertension and obesity, and 8,1% had hypertension, obesity, increased total cholesterol and LDL-cholesterol.

**Conclusion:** 1. Overweight or obesity is the most popular risk factor in young hyperensives.

2. In this population hypertension was very often associated with dyslipidemia and family history.

## T3:PS.141

**Serum leptin levels in non - diabetic and type 2 diabetic obese subjects and its relationship to anthropometric indices**

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**Background and Objective:** Type 2 diabetes mellitus (T2DM) is strongly associated with obesity in most but not all ethnic groups, suggesting important ethnic differences in disease susceptibility. Leptin, the product of the ob gene, could have a significant role in the pathogenesis of obesity and non-insulin-dependent diabetes mellitus. The aim of this study was to investigate the effects of diabetes on plasma leptin concentrations in obese subjects and its relationship to anthropometric indices.

**Materials and Methods:** In this case-control study, 35 obese subjects with type 2 diabetes as case group and 35 non-diabetics obese as control group recruited: Fasting lipid profile was measured by the enzymatic methods. NycoCard HbA1c Kit was used to measure HbA1c. The Serum leptin, insulin and glucose levels were measured by an enzyme immunoassay, using a commercially available kit and glucose oxidase methods respectively. The insulin resistance index was calculated using fasting glucose and insulin by homeostasis model assessment (HOMA-IR).

**Results:** The mean insulin resistance index (HOMA-IR), HbA1c, diastolic blood pressure, triglyceride and fasting glucose in diabetic patients were significantly higher than non-diabetic subjects (P < 0.05). There was a significant difference in serum leptin levels between diabetics and non-diabetics (30.36 ± 2.46 vs. 21.51 ± 2.18) and were significantly higher in women than men (31.85 ± 4.49 vs. 12.80 ± 2.07 in diabetic) and (36.11 ± 2.52 vs. 23.55 ± 3.93 in non-diabetic) in both groups. There was a positive and significant correlation between serum leptin levels with hip circumference, gender and BMI (r = 0.666, p = 0.000 in diabetic and r = 0.490, p = 0.003 in non-diabetic) in both groups.

**Conclusion:** It is found that serum leptin level is lower in diabetic obese subjects than non-diabetics. In addition, it is even lower in the poorly controlled diabetic patients. Therefore, it is suggested that further studies are required to make clear the mechanisms of being lower leptin levels in obese diabetic subjects.

**Key Words:** obesity, type 2 diabetes, leptin, HOMA-IR, BMI

## T3:PS.143

**Metabolic syndrome in young obese: how valid are idf criteria?**

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Two criteria of the IDF definition for the Metabolic Syndrome (MetS) in young obese aged 10 to <16 years were questioned: blood pressure (BP) >130 and/or 85 mmHg defining hypertension and fasting glucose (FG) >5.6mmol/L defining insulin resistance (IR) (Zimmet, The Lancet 2007). **METHODS.** 54 girls and 43 boys aged 10 to 15 years (mean: 12±2 y) were investigated. All had a BMI superior to the 30 kg/m<sup>2</sup> calculated for age and gender (Cole, BMJ 2000). SBP, DBP, HDL, TGL, FG and fasting insulin (FI) were measured. Children with FI>20µU/ml had an OGTT. **RESULTS.** 13 children had SBP>130 mmHG and 2 of them DBP>85; 23 had SBP>P95 and 2 DBP>P95 for age, gender and height centile (NHBPEP, Pediatrics 1996). 19 had HDL<1.03 mmol/L and 10 TGL>1.7 mmol/L. No FG>5.6 mmol/L was found but 44 children had a FI>20µU/ml. In 36, OGTT revealed 2 glucose intolerance (glucose>7,7mmol/L at 120 min) and 22 abnormal high insulin response (insulin>150µU/ml at any time and/or >75µU/ml at 120 min) reflecting IR (Reaven, J Clin Endocrinol Metab 1996). According to the IDF definition 7 children (7%) had MetS: obesity + two criteria; they were 19 (20%) considering the BP>P95 and the OGTT high insulin response. No child had MetS: obesity + 3 IDF criteria; they were 4 (4%) according our adaptations. **CONCLUSION.** In this young obese population more MetS were diagnosed using BP>P95 and OGTT high insulin response than with the respective IDF criteria.

## T3:PS.144

**Adipose tissue and metabolic syndrome as putative sources for circulating matrix metalloproteinase-9**

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**Objectives:** Matrix metalloproteinase 9 (MMP-9) is over-expressed in atherosclerosis and many cancers and has emerged as a promising circulating biomarker for such diseases. However, adipose tissue might also produce circulating MMP-9. The aim was to examine whether adipose tissue is a possible source for MMP-9 in the circulation, and if the metabolic syndrome might have a modifying effect.

**Design, Subjects, Interventions:** Gene expression of MMP-9 was explored in adipose tissue, isolated adipocytes, atherosclerotic plaques, macrophages and various other human tissues. Both adipose tissue gene expression levels and plasma levels of MMP-9 were measured in obese subjects with and without the metabolic syndrome, treated with a weight-reducing diet. Relations between plasma MMP-9 and measurements of obesity and metabolic syndrome factors were analyzed in a population-based cohort of 61-year-old men.

**Setting:** Research unit at university hospital.

**Results:** Adipose tissue MMP-9 expression was high compared to that in most of other tissues, but atherosclerotic plaques and macrophages had considerably higher levels. Plasma MMP-9 was not associated with BMI. There were no correlations between plasma MMP-9, and adipose tissue MMP-9 expression, or changes in BMI. MMP-9 expression in adipose tissue was down-regulated, and plasma MMP-9 concentrations decreased during weight loss among obese patients with the metabolic syndrome. In the population-based study, MMP-9 concentrations correlated to biomarkers of inflammation, and metabolic syndrome tended to be associated with increased MMP-9 levels.

**Conclusion:** Adipose tissue mass itself does not seem to contribute to circulating MMP-9, but rather obesity-related conditions such as metabolic syndrome and inflammation.

## T3:PS.146

**Thyroid Function and Metabolic Syndrome in Euthyroid Taiwanese Elderly**Yang, YC<sup>1,2</sup>, Lu, FH<sup>1,2</sup>, Wu, JS<sup>1,2</sup>, Huang, YH<sup>2</sup>, Wu, CH<sup>2</sup>, Chang, CJ<sup>1,2</sup><sup>1</sup> Department of Family Medicine, College of Medicine, National Cheng Kung University, Tainan, Taiwan<sup>2</sup> Department of Family Medicine, National Cheng Kung University Hospital, Tainan, Taiwan

Both hypothyroidism and hyperthyroidism have been linked with increased risk for cardiovascular diseases. We examined the relationship between thyroid function and metabolic syndrome in euthyroid elderly. A total of 1393 Taiwanese elderly subjects (782 men and 611 women with a mean age of 71.9±5.0) in euthyroid state (with serum free thyroxine level between 0.8 and 2.0) were enrolled in 2000. A modified National Cholesterol Education Program definition of metabolic syndrome was adopted using Asia-Pacific cut-off for waist circumference and 100 mg/dL cut-off for fasting glucose level. The serum thyroid stimulating hormone (TSH) concentration were significantly associated with the metabolic syndrome and its components including waist circumference, high-density lipoprotein cholesterol and triglyceride levels. In multiple logistic regression model with adjustments for age, sex, body mass index, education level, cigarette smoking and alcohol drinking habit, comparing to subjects with middle tertile of TSH, subjects with upper tertile of TSH but not subjects with lower tertile had significantly increased risk to have metabolic syndrome. In conclusion, high TSH levels, but not low TSH levels, albeit normal, were associated with metabolic syndrome in euthyroid elderly Taiwanese.

## T3:PS.145

**Metabolic syndrome: risk reduction through VLCD and cognitive-behavioral group**

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MENTORS: Dr Ravenna, M, Dra Picone, F System Assistant: Gonzalo Godoy

Centro Terapeutico Maximo Ravenna (CTMR) Buenos Aires, Argentina September 2007

**Purpose:** To determinate whether weight loss through VLCD diet along with cognitive-behavioral group therapy favored the modification of the risk factors, early diagnosis and prevention of Metabolic Syndrome

**Method and resources:** 40 medical histories were selected randomly from CTMR records for the 2004-2007 periods, selecting obese patients (BMI above 25), and a waist circumference higher than 103 cm for men and 88cm for women (ATP III 2005/IDF/AHA/NHLBI)

24 patients were selected, the average age was 45 to 55 years old, with preponderance of women.

**Outcome:** The total of the patients assessed presented at least one of the criteria of inclusion for Metabolic Syndrome at the time of admission. The percentage recorded was: 100% for obesity, 40% for dislipemia, 37% for high blood pressure, and 23% for type 2 diabetes

a total of 57% of the patients had 2 or more risk factors, and 43% shared one factor in common.

The BMI for the whole group was higher than 37%, and waist circumference, in both men and women, were above normal parameters

At discharge time 57% of the patients reached a BMI equal to 24%, with reduction of the waist circumference to normal levels, and reversion of more than 2 risk factors in each case under analysis.

85% of the patients changed nutritional habits, and get a satisfactory level of adherence to the practice of physical activity.

**Conclusion:** All the patients treated with VLCD and cognitive-behavioral group therapy show a lost weight with changes of BMI, waist circumference and values of the risk factors to normal levels.

## T3:PS.147

**The effect of metformin on selected parameters in patients with the metabolic syndrome.**Cymerys M., Wysocka E., Bryl W., Miczke A., Pupek-Musialik D<sup>1</sup>.<sup>1</sup> University of Medical Sciences, Poznan, Poland

The metabolic syndrome is characterised by the simultaneously occurring and clustering of several cardiovascular and metabolic risk factors. Metformin can improve insulin resistance and reduce body weight in patients with diabetes mellitus type 2, but also can influence the development of diabetes in patients with well-known risk factors such as obesity or pre-diabetic states. The aim of this study was to evaluate the effect of metformin on anthropometric and biochemical parameters in patients with metabolic syndrome without diabetes mellitus type 2.

**Methods:** We studied 30 patients (19 women and 11 men; mean age 46.3 +/- 5.8) with metabolic syndrome diagnosed based on IDF criteria, but subjects with diabetes were excluded. Study group was divided into two subgroups: treated with metformin in dose 1500 mg/day during 3 months (group A; n=16) and treated only by non-pharmacological methods (group B; n=14).

**Results:** Patients who were treated with metformin had similar weight, % fat content, waist circumference decreasing as patients treated by non-pharmacological methods. There were no significant change of triglycerides and LDL-cholesterol in study subgroups, HDL-cholesterol increased in both groups after treatment. In patient treated with metformin higher decreased of fasting glucose level (-16.3 v. -7.6 mg/dl; p<0.05) were observed.

**Conclusions:** 1. Three months regimen of metformin don't have any additional effect on weight reduction in patients with metabolic syndrome than in subjects treated only by non-pharmacological methods. 2. Metformin can reduce fasting glucose level in patients with metabolic syndrome without diabetes mellitus type 2.

## T3:PS.148

**Obesity and lipid profile in smokers with type 2 diabetes in Greece.**

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1. Asklepeion General Hospital Obesity Outpatient Clinic.  
2. Korinth General Hospital Obesity Outpatient Clinic.

**Objectives:** To examine relationship between smoking, obesity and lipid profile in Greek smokers with type 2 diabetes, we study parameters regarding weight and lipids.

**Methods:** Data from patients observed for six months. They were categorized in the basis of smoking or not, and following or not a strict diet pattern. Evaluation of association between smoking diet Body mass index (BMI) Weight, Weight Difference in six months(WD), glycated haemoglobin (HbA1c), Cholesterol, triglycerides, high and lowdensity lipoprotein (HDL), (LDL).

**Results:** 408 Patients (mean age 65,5 years), 189 males 219 females mean age 63. Performing t test for independent samples by groups we found: No difference on BMI, weight, WD Tg, HDL between patients following and not following diet (p 0.17, 0.14, 0.96, 0.31, 0.73) respectively. There was a statistical significance difference in HbA1c p 0, 001. Patients on diet had statistically significant higher values of Chol and HDL p 0,014 and 0,045. Regarding smoking there was no statistical difference between smokers and not regarding BMI, WD, HbA1c, Tg and LDL, (p 0.91, 0.31, 0.31, 0.50, 0.54). Smokers were heavier than non smokers (p 0.049. Non smokers had also statistically higher values of Chol and HDL(mean 215 mg/dl and 51mg/dl) than smokers (mean 204 mg/dl and 47mg/dl).

**Discussion:** Our results suggest that smoking affects negatively glucose, lipids regulation and weight gain in type 2 diabetics

## T3:PS.150

**The use of therapeutic agents that improve cardiovascular risk in overweight hypertensive patients**

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I<sup>st</sup> Propedeutic Department of Internal Medicine, Department of Vascular Diseases, AHEPA University Hospital, Thessaloniki, Greece.

The aim of our study was to determine the use of certain agents that have been proved to exert cardiovascular protective properties in overweight hypertensive patients.

We examined 376 hypertensive patients attending their first visit in our Department of Vascular Diseases, 301 of whom (119 men and 182 women) were overweight (BMI > 25) and were included in the study (mean age= 54,6 ± 12,7 yrs). 85,4% of the patients were dyslipidaemic, 20,3% current smokers, 6,6 % had diabetes and 19,6% had a previous cardiovascular event. 25,6% of the patients were taking beta blockers, 27,6%, Ca channel blockers, 21,9% diuretics, 46,5% ACE inhibitors or AT1 blockers and only 5,3% statins, while none was under antiobesity drug treatment. The majority of the patients (41,9%) was under antihypertensive monotherapy. Study population was divided into high risk (= history of cardiovascular disease or diabetes->20% 10-year cardiovascular risk-23,6%) and medium risk patients (> 2 major cardiovascular risk factors- 10-20% 10-year cardiovascular risk-76,4%). 11,3% of high risk patients was receiving statins and 53,5% ACE inhibitors or AT1 blockers compared with 3,5% (p=0,01) and 44,3% (p>0,05) of medium risk patients respectively.

In conclusion, 46,5% of this overweight hypertensive population was taking ACE inhibitors or AT1 blockers and only 5,3% statins. Although the proportion of statin use in high risk patients was significantly higher than in medium risk patients, these proportions are remarkably low for these patients' groups. On the contrary, a satisfactory proportion of both groups were receiving ACE inhibitors or AT1 blockers, but this difference was not significant.

## T3:PS.149

**Osteopenic syndrome in women with insulin resistance**

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The Urals State Medical Academy, Ekaterinburg, Russian Federation

**Aim:** to assess the influence of insulin resistance on the development of osteopenic syndrome.

**Methods:** case control study included 162 women with osteopenia or osteoporosis diagnosed by distant radius X-ray absorptiometry ("DTX 200"). Cases group consisted of 62 patients with metabolic syndrome (MS) according to NCPE ATP III criteria. Members of the Controls group were osteopenic and had no MS. Anthropometry, glucose and lipids metabolism parameters were registered.

**Results:** patients with osteoporosis (T-score ≤ -2.5) were less frequent in Case group( $\chi^2 = 4.501$ ; p = 0.034), but there was no difference in atraumatic fractures frequency between the groups ( $\chi^2 = 0.278$ ; p = 0.870).

**Conclusion:** MS may be associated with low bone mineral density. Comorbidity of MS and osteopenic syndrome is very specific for postmenopausal women.

**Track 4: Behavioural change and Patient Education****Track 4 ISC Abstract Selected Posters**

## T4:PS.01

**Educational program for health care providers for foot ulcer prevention in obese diabetic patients**

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**Background:** The prevalence of "at-risk" foot in hospitals is high. Diabetic patients present the majority of persons with "at-risk" foot. The identification of that population is therefore mandatory to prevent severe foot lesions. It is well recognised that the existing preventive foot care programs for health care providers (HCP) in hospitals are insufficient.

**Objective:** To improve the competence of HCP in order to diminish the incidence of foot ulcers in obese diabetic patients.

**Methods:** All HCP of the Loëx hospital participated in a longitudinal prospective study. Different professions (doctors, nurses, nursing aides, physiotherapists, occupational therapists, speech-language therapists, and psychologists) attended an educational program during a 1-year period. During the sessions, risk factors, therapeutic and preventive interventions are discussed with both the patient and HCP. A questionnaire was developed and used to evaluate (i) initial knowledge of HCP in the field of "at-risk" foot, and (ii) the impact of the program on knowledge of HCP twelve months after starting the program.

**Results:** A total of 236 questionnaires before and 172 questionnaires 12-months post program were completed. Significant knowledge improvement has been noted in all groups of HCP, except for doctors. Nurses presented the most significant rise in knowledge score (P<0.001). Some behaviour modifications of HCP were observed at 12-months (e.g. requests for protective shoes – 21 before vs 41 after).

**Discussion:** An educational program, based on active participation of HCP in a pluridisciplinary consultation, improve early identification as well as the follow-up of the at-risk foot in diabetic obese patients with at-risk foot.

## T4:PS.02

**Does quality of life influence weight loss one year after a gastric bypass?**Klingemann, J<sup>1</sup>, Iliescu, I<sup>1</sup>, Badel, S<sup>1</sup>, Morel, P<sup>2</sup>, Chasoz, G<sup>2</sup>, Golay, A<sup>1</sup><sup>1</sup>Service of Therapeutic Education for Chronic Diseases, Geneva University Hospital, Switzerland<sup>2</sup>Service of Digestive Surgery, Geneva University Hospital, Switzerland**Background:** improving quality of life (QoL) is one of the corner stones of the bariatric surgery along with decreasing obesity related morbidity.**Objective:** how losing weight influences the QoL one year after gastric bypass (GBP), and whether HRQoL prior to surgery predicts the amount of weight loss one year after GBP.**Method and subjects:** 139 severely obese women admitted for GBP were selected prospectively. All patients completed the Nottingham Health Profile (NHP) quality of life questionnaire before surgery. A subgroup of 62 patients completed the NHP also one year after surgery.**Results:** Weight loss one year after GBP was significant ( $-37.8\text{kg} \pm 0.9$ ,  $p < 0.000$ ; excess weight loss =  $75\% \pm 0.4$ ,  $p < 0.000$ ) and led to a significant improvement in NHP total scores (before surgery  $36 \pm 6.3$ ; after surgery  $17.9 \pm 3.2$ ,  $p < 0.000$ ) in all dimensions excepting sleep and social isolation. However, QoL prior to surgery did not influence the percentage of excess weight loss (EWL %) or BMI one year after GBP.**Conclusion:** QoL improves dramatically one year after GBP. This QoL improvement is not influenced by the amount of weight loss, but rather by the BMI achieved at that time. QoL prior to surgery is not a predictive factor for the outcome of the bypass at one year in terms of losing weight or BMI achieved.

## T4:PS.04

**Comparing the incidence of Overweight and Obesity in UK born Children living in the UK with those living in Spain**Laws CJ<sup>1</sup> and Potter, JA<sup>1</sup><sup>1</sup> University of Chichester, Chichester, UK

This study investigated the prevalence of overweight and obesity in 156 Caucasian 11-14 year olds born in the UK. Half of the group (78) lived in mainland Spain, the other half lived in the UK. The groups (Spain and UK) were age and sex-matched but were otherwise chosen randomly from larger body of data including a broader range of ethnic and social diversity. Heights were recorded using a stadiometer, mass and body composition analysed using Tanita BC-418MA body composition analyser. Lifestyle questionnaires were also completed. Age and sex-related criteria for BMI and F% were applied to characterise both groups. The percentage of the population falling into the categories of overweight and obese for the two criteria is presented below.

Percentage of the population characterised as overweight or obese

Country	BMI criteria		Fat % criteria	
	UK	Spain	UK	Spain
Male	27	12	28	21
Female	16	11	18	11
Overall	22	11	23	16

The proportion of those living in the UK and categorised as overweight or obese is significantly higher using BMI categories as those compared with Spain ( $F_{(1,152)} = 3.89$ ,  $p=0.05$ ) and approaching significance for Fat % criteria ( $p=0.06$ ). No differences were found between male and female populations as it appears that girls are leaner than boys. UK girls appear to be lean compared to other reports of incidences of obesity in the UK. This study although rather speculative does have implications for the consideration of the nature of children's environment and possible affects on body composition.

## T4:PS.03

**Groups, Classes and Clubs: A Qualitative Study of Attendees and Leaders of Commercial and Health Service-Based Weight Loss Groups.**Allan, K<sup>1</sup>, Hoddinott, P<sup>2</sup>, Avenell, A<sup>2</sup>, Broom, I.<sup>1</sup> Faculty of Health and Social Care, The Robert Gordon University, Aberdeen, Scotland<sup>2</sup> Health Services Research Unit, The University of Aberdeen, Scotland**Background:** Group-based interventions for weight loss are popular. However, little is known about how health professionals implement and deliver groups and how this compares and contrasts to the commercial sector.**Aims:** To compare and contrast existing models of group-based treatments for weight loss and to gain a user and leader perspective of health service and commercial programmes.**Methods:** Purposive sampling, guided by a sampling frame, was employed to identify groups with diverse characteristics and with differing content, structures and style. Six health service, six commercial groups and one self-led group were observed operating in their real life settings within Scotland. Subsequently, 11 semi-structured interviews with group leaders and 22 interviews with group attendees were conducted. The study used a grounded theory approach and applied the Framework Method for qualitative data analysis.**Findings:** Compared with commercial groups, health service groups tended to offer short-term, closed-programmes, involving fewer attendees. Attendee expectations of the group leader varied according to the type of group attended, but seeking extrinsic motivation and inspiration from the group leader were common to both. There were gender differences in relation to the attendees' expectations of group leaders and the group process. Health service leaders had less opportunity for supervision or training in how to run their groups compared with commercial leaders.**Conclusions:** Resources, styles and structures differ both within and between commercial and health service sectors. Developing effective health service groups requires further studies to test factors such as group composition, programme flexibility and leader training.**Funding:** Research relating to this abstract was funded by an NHS Grampian (A Scottish Health Board) Endowment Fund, and The Chief Scientist Office of the Scottish Government Health Department.

## T4:PS.05

**A one day outpatient motivational workshop to enhance physical activity**Amati F.<sup>1,2</sup>, Barthassat V.<sup>1</sup>, Deletraz, M.<sup>1</sup>, Garcia-Paillard M.<sup>1</sup>, Gay V.<sup>1</sup>, Joly C.<sup>1</sup>, Layat-Blyweert V.<sup>1</sup>, Miganne G.<sup>1</sup>, Rodriguez M.<sup>1</sup>, Golay A.<sup>1</sup><sup>1</sup> Service for Therapeutic Education for Chronic Diseases, Geneva University Hospital, Geneva, Switzerland, <sup>2</sup> Department of Health and Physical Activity, University of Pittsburgh, Pittsburgh, Pennsylvania, USA**Objective:** Physical activity (PA) is important for managing chronic diseases, such as diabetes and obesity. Yet most patients who adopt PA programs do not maintain them at 6 months. To motivate patients to continue PA, we developed and pilot-tested a 1-day outpatient workshop that incorporated multiple theoretical frameworks for therapeutic education and behavior change and that alternated individual sessions with group sessions in a multidisciplinary setting. **Methods:** We asked patients to complete a validated, self-administered, PA frequency questionnaire before attending the workshop and 1 year later. We used *t*-tests to measure changes over time in body mass index (BMI), daily activity-specific energy expenditure (EE), and daily total EE.**Results:** The 25 study participants had a mean age of 48 years and mean BMI of  $34.1\text{ kg/m}^2$ . At baseline, 73% reported regular activities of daily living, 52% reported regular formal exercise sessions, and EE measures indicated that 69% were sedentary and 76% were at risk of a return to sedentarism. Comparison of preworkshop and postworkshop questionnaires showed a decrease in weight and BMI ( $P < 0.05$ ) and an increase in high-intensity exercise EE ( $P < 0.05$ ) but no significant change in total EE. Of the sedentary subjects, 39% became active.**Conclusion:** The workshop may be effective in decreasing sedentarism and fostering continued PA. This workshop provides an example of adapting multiple theoretical models to clinical practice.

## T4:PS.06

**Faddy crash diets in student population**Banjari, I<sup>1</sup>, Kenjerić, D<sup>1</sup>, Mandić, M L<sup>1</sup><sup>1</sup> University J.J. Strossmayer, Faculty of Food Technology, Osijek, Croatia

**Abstract:** Weight management is raising phenomenon in young people, only not as a result of health concern but a reaction to pervasive cult of slenderness largely perpetuated through the media. The aim of our research was to determine how students, especially females, perceive themselves, and manage their body weight. Also, we wanted to see the impact of media bombarding with different fad diets. 149 students completed questionnaires, 119 females and 30 males, age 18-24. Using self-reported height and weight, BMI was calculated; 12.1% were underweight and 16.1% overweight. The results showed that according to self-perceived body size only 5.4% participants thought they were underweight, while 21.5% thought being overweight. As expected, 42.0% of females were trying to lose weight and dieting. For females, the issue seems to lie with feeling fat (44.0%) to a greater extent than being overweight (26.0%). 68.0% of dieting females were on fad diet 1-4 times with personal dissatisfaction being the main motive. Almost half of them (46.0%) were not persistent in keeping the diet, and 32.0% said they had gain back lost pounds within next 6 months. Although BMI's showed 33.3% males were overweight, only 16.7% thought they were, and 10.0% were trying to lose weight and dieting. 22.6% used magazines as a source of diet, 15.4% took seriously nutritional advices from magazines, and 14.9% of them took a fad diet. In conclusion, body weight management by dieting is widely spreaded among females, and popular magazines are, unfortunately, the source of diet in many cases.

**Key words:** student population, fad diets, media, obesity

## T4:PS.08

**Evaluative Conditioning of Preferences for High-Fat Foods in Obese and Overweight Children**Hartmann, A<sup>1</sup>, Merz, L<sup>1</sup>, Erb, C<sup>1</sup>, Michael, T<sup>1</sup>, & Munsch, S<sup>1</sup><sup>1</sup>Faculty of Psychology, University of Basel, Basel, Switzerland

High-fat nutrition is an important factor in the development of obesity. Obese children show an increased preference for high-fat foods. In an experimental task, the present study investigates how body weight and explicit nutritional knowledge influence children's preference learning (through the learning mechanism of evaluative conditioning). Furthermore, the preference's influence on actual food intake is examined in a behavioural task.

In our experimental paradigm (according to Field, 2006), children aged 8-12 years were shown two cartoon characters on a computer screen. They were consistently paired with either a picture of a high-fat or a low-fat food. Before and after the presentations, relative preferences for the characters were registered. Nutritional knowledge was measured using a self-constructed questionnaire. In a behaviour task, the children's choice between two kinds of chocolate bars, depicted with either the high-fat food paired character, or the low-fat food paired character, was recorded.

The rating of the positively but not the negatively conditioned character increased more from pre to post conditioning the higher the BMI percentile of the rating child. Children with more nutritional knowledge were less likely to be conditioned on fat. Children with higher BMI percentile also tended to choose the chocolate depicted with the positively conditioned character more often.

The findings indicate that preference for high-fat foods might be learned more easily in overweight children. Efforts should be made to render healthy food choices more attractive and to incorporate preference learning in future treatments to guide children and families to choose healthy food.

## T4:PS.07

**'Swim for Health:' Barriers to participation for pre-school aged children and their families in an aquatic activity intervention in the North of England.**Evans, A. B.<sup>1</sup> and Sleep, M.<sup>1</sup><sup>1</sup>University of Hull, Kingston Upon Hull, United Kingdom.

'Swim for Health' was the first of a number of health initiatives instigated by the National Governing Body for Aquatic Activity in the UK, the Amateur Swimming Association. This initiative is a multi-agency partnership with the aims of increasing participation in aquatic activities and decreasing health inequalities across the region. Aquatic activity offers great potential for reducing obesity levels in at risk communities (e.g. Hardy 1990). A key group within this intervention was children of pre-school age and their parents in lower socio-economic groups.

The study aimed to identify perceived barriers to participation in this group. 26 semi-structured interviews and 12 focus groups were carried out with 54 individuals. All participants were female parents aged between 19 and 44 years. Questionnaires were completed with 132 individuals. These data were used to complement interview data.

Results indicate only 50% of participants engaged in physical activity without their families. Participants' male partners engaged more in physical activity alone, suggesting strong gender roles in physical activity choices. Where solitary physical activity was in evidence, perfecting the body through 'bodywork' was central. However, swimming was still popular as a family activity. Participants felt less self-conscious about the perceived deficiencies of their bodies when swimming with their families as they focussed instead on their children's wellbeing, pool hygiene and risk. Hence, participants emphasised children's water safety. Time constraints were a key barrier to participation.

Despite participants stating their interest in swimming, significant barriers exist for this group. These barriers were often linked to gender roles.

## T4:PS.09

**Effects of eating a specific vs. a neutral food item on the rewarding value of foods in general**Lemmens, SGT<sup>1,2</sup>, Nieuwenhuizen, AG<sup>1,2</sup>, Schoffelen, PFM<sup>1</sup>, Wouters, L<sup>1</sup>, Sekulovic, A<sup>1,2</sup>, Born, JM<sup>1,2</sup>, Rutters, F<sup>1</sup>, Westerterp-Plantenga, MS<sup>1,2</sup><sup>1</sup>Department of Human Biology, Maastricht University, Maastricht, The Netherlands<sup>2</sup>Top Institute Food and Nutrition, Wageningen, The Netherlands

**Background:** Human eating behaviour can be influenced non-homeostatically by the rewarding value of foods, i.e. liking (pleasure/palatability) and wanting (incentive motivation).

**Objective:** How is the rewarding value of foods affected by eating a dessert-specific vs. a healthy, dessert-neutral food item?

**Methods:** Thirty subjects (10m/20f, age 28.2±9.0 years, BMI 24.2±3.3 kg/m<sup>2</sup>), studied in a randomized cross-over design, came to the university twice in a fasted condition and played computer-games that quantified the rewarding value, i.e. liking and wanting, for 72 items divided in 6 categories (bread, filling, drinks, dessert, sweets, and stationary (placebo)). Liking was quantified by indicating the relative preference of paired items (within and between categories) and wanting by working (playing a memory-game) for a maximum amount of items to choose from. The games were played before and after consumption of chocolate mousse or cottage cheese, both matched for energy content (5.6 kJ/g) and daily energy requirements (10 %).

**Results:** Chocolate mousse was liked more than cottage cheese (p=0.0016). Wanting for food from any category was decreased more after eating chocolate mousse (p<0.0001) than after eating cottage cheese (p=0.1539). Contrarily to cottage cheese, chocolate mousse induced a relative switch in liking between categories, thereby decreasing the dessert category (p=0.0004) and increasing the stationary category (p=0.0023).

**Conclusion:** Eating a liked category-specific food item decreases wanting of food items in general more than eating a less liked category-unspecific food item, and shows a category-specific reduction in relative liking.

## T4:PS.10

**Obesity, Diabetes and Migration: The Gap Between Reality And Beliefs**Schindler K<sup>1</sup>, Brath H<sup>2</sup>, Carballo M<sup>3</sup>, Ludvik B<sup>1</sup><sup>1</sup>Medical University Vienna, Vienna, Austria, <sup>2</sup>Wiener Gebietskrankenkasse, Vienna, Austria, <sup>3</sup>International Center for Migration and Health (ICMH), Geneva, Switzerland**Background:** Migrants of different ethnic background seem to have a higher risk of developing type 2 diabetes than native Austrians. However, there seem to be barriers to the use of health services or appropriate treatment due to cultural and religious peculiarities.**Aim:** To examine the access to health care and treatment as well as diabetes-specific knowledge of migrants with diabetes (M) in Austria in comparison with native diabetic Austrians (A).**Methods:** 54M and 48A with diabetes were interviewed in their first language with questionnaires provided by the ICMH (Geneva). Relevant medical data were recorded.**Results:** Migrants lived in Austria since 24.7±1.5 years (Mean±SEM). In M age at diabetes diagnosis was 44.4±1.3y (A: 46.4±1.3). Mean Body Mass Index in M was 31.3 ±0.6kg/m<sup>2</sup> (A: 34.2±1.0kg/m<sup>2</sup>, p=0.02). In 15% of M, diabetes was diagnosed during routine medical examination (A:59% p=0.0001). 79% of M and 100% of A classified themselves correctly as overweight (between groups p=0.02). Knowledge about factors predisposing to diabetes (obesity, genetics, age) was less in migrants compared to Austrians. Patients of both groups believe that diabetes is under control (M:67%, A:77%). A majority of patients in both groups considered diabetes control as adequate, however a HbA1c below 7% was achieved only in 28% of all patients (M:31%, A:26%).**Conclusion:** These data show that migrants seem to utilize health services to a lesser extent and tend to misjudge factors predisposing to diabetes when compared to native Austrians. These findings warrant intensive efforts to improve access of migrants to health care system.

## T4:PS.12

**An Electronic Device for Measuring Appetite and Physiological Profiles (EDMAPP) in Clinical Trials**<sup>1</sup>Blundell JE, <sup>2</sup>King NA, <sup>3</sup>Loewenich F, <sup>4</sup>Caudwell P, <sup>5</sup>Finlayson G, <sup>6</sup>Hills A, <sup>7</sup>Byrne N, <sup>8</sup>Hopkins M, <sup>9</sup>Naslund E, <sup>10</sup>Stubbs RJ.<sup>1</sup>BioPsychology Group, University of Leeds, Leeds, UK; <sup>2</sup>Institute of Health and Biomedical Innovation, Queensland University of Technology, Brisbane, Australia; <sup>3</sup>Slimming World, UK, <sup>4</sup>Clinical Sciences, Danderyd Hospital, Karolinska Institutet, Sweden.

With the introduction of palmtop devices and mobile technology, several operating systems are now available to measure a variety of physiological and behavioural parameters. Most of these systems measure one variable (e.g. blood glucose, subjective states). Therefore, a collection of separate devices need to be used to measure several variables. The electronic appetite rating system (EARS) was originally designed to measure subjective states of appetite and mood using the visual analogue scale technique (Stratton et al, 2002; Delargy et al, 1999). The aim of this current development is to upgrade the EARS and to integrate a range of behavioural and physiological measures on a single device. The Electronic Device for Measuring Appetite and Physiology Profiles (EDMAPP) will provide a novel data capture tool for behavioural and physiological measures in clinical trials. Using Windows operating system, a Hewlett Packard PDA was used to administer subjective appetite and mood sensations, a liking and wanting food preference procedure (Finlayson et al, 2007), and self-report questionnaires. Further programming is currently being performed to include measures of cognitive performance, food intake, physical activity blood glucose and body weight.

Using bluetooth technology the data will be automatically downloaded to a secure internet site. In addition, the system could provide individuals with valuable feedback about their behavioural and physiological profiles. Such a device which is capable of measuring physiological and behavioural variables associated with energy balance and weight management, would serve as a useful technique to be used in clinical trials and as a personal weight management tool.

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## T4:PS.11

**Integrated Care - Obesity and Metabolic Syndrome**Vogt A.<sup>1</sup>, Kassner U.<sup>1</sup>, Terán C.<sup>3</sup>, E. Steinhagen-Thiessen<sup>1</sup>, B. F. Klapp<sup>2</sup>, R. Kocalevent<sup>2</sup><sup>1</sup>Lipidclinic, Interdisciplinary Metabolic Center, Charité, Humboldt-University, Berlin, Germany<sup>2</sup>Int. Medicine – Psychosomatic, Charité, Humboldt-University, Berlin, Germany<sup>3</sup>Psychiatric Department, Charité, St. Hedwig Hospital, Berlin, Germany**Background:** Although the increasing incidence of overweight and obesity as well as the necessary changes of lifestyle are well known it remains almost impossible to implement the knowledge into patients' daily life. Partly this is due to the fact that insurance companies do rarely cover the arising costs.**Aims:** Based on our experience with a structured, multi-disciplinary group-therapy for obese adults over half a year we are developing a one year course together with an insurance company (integrated care). The program comprises medical and diet counseling, sport therapy, and behaviour therapy. The aims are firstly medically and psychosocially and secondly a higher participation rate due to an assured reimbursement.**Method:** The "Integrated Care"-project is a collaboration of Charité, Universitätsmedizin Berlin with the DAK (Deutsche Angestellten Krankenkasse). Prior to participation a strict inclusion course has to be followed. This is to exclude patients, e.g. without intrinsic motivation, with psychiatric disorders, or with limiting medical conditions, who would not benefit from this kind of program.

The program is running over one year and comprehends physical activity, behaviour therapy and diet counseling. Quarterly medical and interdisciplinary conferences are scheduled.

For morbid obese patients bariatric surgery is possible after half a year and these patients are supported after surgery to enhance the success.

A close cooperation with the general practitioners and the insurance company are also implemented.

**Conclusion:** We expect a rapid generation of groups and a facilitated organisation. The course over one year should further enhance the good results of the shorter program.

## T4:PS.13

**Negative Body Image for Obese Women**Marrez, A; Baudimont, A; Dhaene, I; Lecocq, P; Dereppe H, M.D.<sup>1</sup><sup>1</sup>Association Interhospitalière du Tournaisis, Centre d'orthonutrition, Tournai, Belgium.**Objective:** Evaluate and improve negative body image for obese women with eating disorder.

We took patients that followed a weight management group in the past.

**Methods:** We created a "therapeutic group" during six months, two hours ever two weeks : 6 patients, mean age : 52.5 and mean BMI : 37.6 Kg/m<sup>2</sup>.

We based on the program for body-improvement: "The body image workbook" published by Thomas F. Cash. We translated this program in French and adapted the protocol for our population: 13 seances instead of 8. We used also questionnaires for evaluating self-esteem, Body Attitude and the "silhouette" test before and after therapy

*The sessions were organised as follow:*

Session 1: discovering personal body image

Session 2: harnessing knowledge for change

Session 3: synthesis

Session 4: destroying distress and create comfortable reflections

Session 5: exposition on the mirror

Sessions 6 and 7: establishing reasonable doubts

Session 8: discussion about critical thinking

Session 9: correcting the private body talk

Sessions 10 and 11: identifying self-defeating behaviours

Session 12: treating body right

Session 13: discussion about how to preserve positive body image for live

**Results:** We observe a better acceptance of their body and more satisfaction with it. They become more contented with their looks, are less self-critical of their body and are less preoccupied with their weight. We observed a better self-esteem and healthier attitudes.**Conclusion:** This therapy had a positive effect on body image, weight and self-esteem.

## T4:PS.14

**Evaluation of Obese Patient: A New Pedagogical Tool**

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**Background and aim:** Taking care of obesity is often de-motivating as far as long term weight lost results. The complexity of obesity needs to be evaluated with other criteria than weight lost. The aim of the project was to create and use a tool that would allow us to highlight the complexity of the treatment of obesity and the transformation of the patient during the follow up, in order to sustain motivation.

**Material and Method:** The tool created is made of seven dimensions that need to be worked with the patients in order to achieve a long term weight lost. The dimensions are: Motivation, Physical Activity, Diet, Alimentary Behaviour, Emotion, Digestive's Sensations and Body Perception. For each dimension the progression expected is described and detailed, according to a progressive scale. The impact of the utilisation of that tool has been evaluated by care givers from different professions.

**Results:** It came out that this tool helps to pinpoint the difficulties of the patient and to elaborate more pertinent objectives. It also allows evaluating the skills acquired by the patients over a longer period of time. The tool becomes a support for the reflection about and with the patient. It also favours interdisciplinarity.

**Conclusion:** This tool uses other criteria than weight loss. It helps to describe and visualise the complexity of the treatment of obese patients and their progression into each dimension. This enlightening of the progression is motivating. It has been perceived as helpful by care givers and patients.

## T4:PS.16

**On-line supported self treatment program with guidance for binge eating disorder.**

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Binge eating disorder is a predictor for poor weight loss and stabilization in obesity and is considered as a potential risk factor for obesity development. Cognitive and behavioural therapy is known to be efficient in binge eating disorder treatment. New technologies can help disseminate these techniques in a cost-effective manner.

An on-line supported self-treatment program for compulsive eating disorders, (STEP), is currently being evaluated with obese and non-obese patients suffering from binge eating disorder at the University Hospital of Geneva.

The STEP program consists of 11 sequential modules based on cognitive and behavioral techniques. Each module includes lessons, examples and exercises. Patients work on a new module every two weeks and have six months to go through the program. During this time, the patient is required to have 3 face-to-face evaluation interviews and to maintain a weekly e-mail contact with a trained psychologist. The program is accessed with a pseudonym and a password. It is only available to patients who are supported by a trained health care professional.

Program efficacy will be evaluated with standardized questionnaires for behavioural measures (eating disorders) and comorbidities (psychological health). Treatment phase is six months with a follow up evaluation six months after end of treatment. Repeated measures of symptoms during the treatment and follow up phases will allow us to describe the course of the illness and might help us find predictors of a good outcome. Some first results will be available at the ECO 08.

## T4:PS.15

**Analysis of mediation and reciprocal effects of changes in weight, self-esteem, and exercise in a behavioral weight loss treatment**

Palmeira, A.L.<sup>1,2</sup>, Teixeira, P.J.<sup>1</sup>, Silva, M.N.<sup>1</sup>, Markland, D.<sup>3</sup>, Branco, T.<sup>1</sup>, Martins, S.<sup>1,2</sup>, Minderico, C.<sup>1</sup>, Serpa, S.<sup>1</sup>, & Sardinha, L.B.<sup>1</sup>

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<sup>3</sup> School of Sport Health and Exercise Sciences, Bangor University, Wales

**Objective:** To analyse reciprocal effects among self-esteem, exercise, and weight loss during (and as a result of) behavioral obesity treatment.

**Methods:** Subjects were 144 women (BMI=31.1±4.1 kg/m<sup>2</sup>; Age=38.4±6.7 y) who attended a 12-month obesity treatment program with weekly/biweekly group sessions covering exercise, nutrition, and behavior modification topics and a randomly-assigned comparison group (n=49), receiving a general health education program. Self-esteem, exercise level, and weight were assessed at baseline and at 12 months. Multiple mediation was tested by multiple regression, following procedures described by Preacher and Hayes (2007). Treatment vs. comparison was the independent variable, while changes in body weight, self-esteem, and exercise were analyzed alternatively as mediators and dependent variables.

**Results:** Weight loss was greater (p<.001) in the intervention group (-5.6±6.8% vs. 1.2±4.6%). Self-esteem improved in both groups (p<.05), while the intervention group was more active at treatment's end (p<.001). The self-esteem mediation model explained 15% of overall weight change (p<.001). Treatment total and direct effects were significant, while only the specific indirect effect of exercise was significant, suggesting that exercise partially mediated the treatment effect on weight change. The weight change mediated model explained 5% of self-esteem's change (p=.036); treatment effects were non-significant, whereas total indirect effects and weight change's specific indirect effects were significant, i.e., only when treatment produced weight loss did the intervention improve self-esteem.

**Conclusion:** Results indicate the absence of reciprocal effects, suggesting that self-esteem improvements are partially caused by weight loss, while weight loss is partially affected by exercise but not by self-esteem changes.

**Track 4 Poster Presentations**

## T4:PS:17

**Physical Activity and Exercise History: Associations with Success in a Weight Management Program for Overweight and Obese Women**

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**Purpose:** To analyze the relation between physical activity (PA) history and weight loss during a behavioural weight management intervention. To our knowledge, this is the first study to investigate this topic.

**Methods:** At baseline, 116 overweight/obese women (age: 38.3±7.0 yr; BMI: 31.9±4.1 kg/m<sup>2</sup>) were randomly assigned to intervention (IG) or control groups. The IG participated in a 12-month weight management intervention seeking to improve diet and nutrition and increase physical activity. Controls received a general health education curriculum. At baseline, participants completed a PA and exercise history questionnaire. PA was categorized by exercise intensity (light, moderate, vigorous) and life period (infancy, adolescence, adulthood) and quantified in min/yr per category. Associations between PA history variables and success were analysed with correlation/regression analyses and comparing success categories at program's end, defined as a weight loss greater than 4.9%; non-success corresponded to losing less than 2%.

**Results:** In the IG, adolescent vigorous PA was associated with weight loss (rho=-0.25;p=0.048), and a trend was observed for total vigorous PA (rho=-0.22;p=0.081). Comparing success categories, the more successful group reported more total (p=0.001) and adult (p=0.004) vigorous PA, and more total adult PA (p=0.027). For controls only, adult (B=0.691;p=0.002) and infant (B=-0.520;p=0.017) vigorous PA were identified as negative and positive weight loss predictors, respectively.

**Conclusions:** Results suggest PA history may predict success in weight management behavioural programs. Reporting higher levels of past vigorous activity, especially during youth, may be a prognostic marker for improved weight loss outcomes for women under behavioural obesity treatment.

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## T4:PS:18

**Demographics, Weight Loss and Satisfaction Results for Consumers Enrolled in the Online Behavioral Support Program for Non-Prescription 60 mg Orlistat**Daggy, B<sup>1</sup>, Schwartz, SM<sup>1</sup>, Foster, GD<sup>2</sup>, Addrizzo, J<sup>3</sup>, Neher, K<sup>3</sup><sup>1</sup>GlaxoSmithKline Consumer Healthcare, Parsippany, NJ, USA, <sup>2</sup>Temple University, Philadelphia, PA, USA, <sup>3</sup>GlaxoSmithKline Consumer Healthcare, Pittsburgh, PA, USA

Orlistat 60mg (alli<sup>®</sup>) has been available in the U.S. via general sale since June 2007. Consumers purchasing the drug receive educational materials in the starter package and have access to an online, tailored behavioral support program (BSP), myalliplan.com. Individuals who enrolled in the BSP from June-November (N=242,263) were mostly female (93%) with an average age of 39 years. Mean BMI was 32.3 kg/m<sup>2</sup>; 9% fell within normal weight (BMI 18.5-24.9), 34 % were overweight (BMI 25-29.9), and 57% were obese (BMI ≥30). Most enrollees were white, non-Hispanic (71%), with 8% African-American and 12% Hispanic. Percent weight loss for enrollees who reported their weight after 4 (N=51,897), 8 (N=26,374) and 12 (N=12,215) weeks in the program was 2.02±0.01%, 3.23±0.02%, and 4.33±0.04% (mean±SE), respectively.

A continuing online satisfaction survey conducted with a subset of enrollees in October 2007 (N=729) found an overall satisfaction rating of 78 (out of 100) with an average rating of 82 for functionality and 81 for site content. The most used features were informational lessons, menu planning, and feedback from check-ins. Most enrollees would recommend the BSP to someone else, were likely to return, and would use the site as the primary resource for obtaining information towards their weight loss goals (average score 80, 81 and 88, respectively). Most consumers agreed the site provided an honest and realistic approach (94%), an individualized plan (80%), and the support they needed (86%). These data support results from previous orlistat 60mg studies and reinforce the importance of an online BSP to weight loss satisfaction and success.

**Conflict of Interest:** B Daggy, S Schwartz, J Addrizzo and K Neher are all employees of GSK Consumer Healthcare which manufactures 60 mg orlistat (alli<sup>®</sup>) in the USA. G Foster is a paid consultant for GSK Consumer Healthcare.

## T4:PS:20

**Changes in Three Measures of Health-Related Quality of Life in Weight Loss Trial Participants**Kolotkin, RL<sup>1,2</sup>, Norquist JM<sup>1</sup>, Crosby, RD<sup>3,4</sup>, Suryawanshi S<sup>5</sup>, Teixeira PJ<sup>7</sup>, Heymsfield SB<sup>6</sup>, Erondu N<sup>6</sup> Nguyen AM<sup>7</sup><sup>1</sup>Obesity and Quality of Life Consulting, Durham, NC, USA, <sup>2</sup>Duke University Medical Center, Durham, NC, USA, <sup>3</sup>Merck Research Laboratories, North Wales, PA, USA, <sup>4</sup>Neuropsychiatric Research Institute, Fargo, ND, USA, <sup>5</sup>University of North Dakota School of Medicine and Health Sciences, Fargo, ND, USA, <sup>6</sup>Merck Research Laboratories, Rahway, NJ, USA, <sup>7</sup>Technical University of Lisbon, Lisbon, Portugal

The objective of this analysis was to compare one-year changes in health-related quality of life (HRQOL) using one obesity-specific (Impact of Weight on Quality of Life-Lite [IWQOL-Lite]) and two generic (SF-36; EQ-5D) measures. We hypothesized the IWQOL-Lite would be more sensitive/responsive to weight change. Data were from a RCT of an NPY-5R antagonist. Participants were ≥18 years with BMI 30-43kg/m<sup>2</sup> (or ≥27kg/m<sup>2</sup> with comorbidities). At baseline and one-year, participants [n=926; mean BMI=35.4; mean age=49.5; 84% female] completed the HRQOL measures and were weighed. Data were pooled to assess the impact of weight change (WC: weight gain, 0-4.9% loss, 5.0-9.9% loss, ≥10% loss) on HRQOL. We considered this approach to be warranted because no meaningful between-group differences in efficacy/safety were observed. For each WC group, effect sizes (ES) were calculated for mean changes in HRQOL. As hypothesized, ES for SF-36 and EQ-5D were smaller than for IWQOL-Lite. For IWQOL-Lite and EQ-5D total scores, improvements in HRQOL were observed in an increasing trend across WC groups, although ES for IWQOL-Lite were larger (0.12, 0.34, 0.62, 0.62, 0.93 vs. 0, 0.03, 0.32, 0.53). For IWQOL-Lite Physical Function and Self-Esteem domains, 5.0-9.9% loss resulted in moderate ES (0.57 and 0.58), whereas ≥10% loss resulted in large ES (0.95 each). For SF-36, Vitality, Social Functioning, Role-Emotional, and Mental Health domains showed deterioration or no change across all WC groups; Physical Functioning domain showed moderate improvement (ES 0.44) for ≥10% loss. In conclusion, compared to generic HRQOL measures, the IWQOL-Lite showed greater sensitivity and responsiveness with WC.

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## T4:PS:19

**Participatory Video and Yurt Camps: How to raise self-esteem in individuals and communities**

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**Background:** Cumbria is the second largest County in the UK and has a widely dispersed population of some 500,000 people. It has a poorly performing economy, a major issue with health inequalities, wide differentials in education achievement especially post-16, poor transport infrastructure, isolated and socially disadvantaged communities and pockets of great wealth, particularly in and around the Lake District National Park. The County's technological communications infrastructure is however very good with a very high take up of broadband internet technologies by individuals and communities. The health of the people is generally poor against European averages in medical conditions such as diabetes, coronary heart disease, and stroke. It suffers from problems of under-age drinking especially in West Cumbria, above average and growing levels of obesity and a higher than average incidence of teenage pregnancy.

**This paper to Conference aims to:** Outline the role and potential of participatory video and photography as a component of personal and community development Consider the transformative potential of working with video and photographic narratives for individuals and communities

Illustrate the range and depth of qualitative data gathered during this Visible Voice project Working in partnership with health professionals, social enterprises, University of Cumbria and local communities, this project makes use of the collaborative potential of participatory video and photography to help people identify and express concerns about everyday life, health and well being. The process of creating and screening of videos and photographic exhibits can and is intended to lead to transformations in the lives of the researchers, participants and their communities. Completed films and photographic exhibits are viewed by the wider community and provide a stimulus for individual and community discussion around health and well being issues raised during the project.

## T4:PS:21

**A multidimensional approach helps patients to learn and change.**Lagger, G<sup>1</sup>, Golay, A<sup>1</sup>, Giordan, A<sup>2</sup><sup>1</sup>Service of Therapeutic Education for Chronic Diseases, University Hospitals of Geneva, Switzerland <sup>2</sup>Laboratory for Didactics and Epistemology of Sciences, LDES, University of Geneva, Switzerland

In the case of several chronic diseases like obesity or diabetes, the health care provider often feels powerlessness, especially in obtaining long lasting behavior changes in their patients. We propose here a multidimensional approach addressing the cognitive (i.e. infra and meta), affective and perceptive dimensions of the person. This pedagogic strategy has been experimented with obese and diabetic patients.

The results show that the patients can develop the capacity to estimate a physical activity intensity, their blood glucose levels, or other body perceptions such as hunger, satiety. In example, 40 diabetic patients have been trained to guess their glycaemia. 95.6% of 341 patient's trials fall in the acceptable Clarke's grid glycaemic domains.

Moreover, this strategy increases the self-esteem of the patients, their motivation to learn (62% to 76% with psycho-pedagogy score) and the acquired knowledge related to the pathology (68% to 80% knowledge score). This has immediate effects on health outcomes, including a better control of the glycaemia (56% to 71% normo-glycaemia).

In conclusion, a complex approach including the expression by the patient of it's body perceptions, related emotions, coupled with a patient education addressing the questions related to the pathology seems to induce behavior changes.

## T4:PS:22

**Are Self-Determination and Motivational Interviewing Useful for Weight Management? Results from a Randomized Controlled Trial in Women**

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**Purpose:** To describe a new treatment for overweight/obese women centered around physical activity (PA) promotion and based on Self-Determination Theory (SDT) and Motivational Interviewing (MI), and report results from an ongoing 3-year RCT.

**Method:** 257 overweight women (BMI: 31.7±4.1 kg/m<sup>2</sup>; age: 37.3±7.5 y) were randomized into intervention/control groups. The intervention included 30 weekly/bi-weekly group meetings covering PA, nutrition/eating behavior, body image, and other cognitive-behavioral contents. MI techniques were used throughout the program. Autonomous motivation and behavioral self-regulation were key intervention targets. Autonomy-supportive treatment climate and internal causality orientations were hypothesized to enhance autonomy, perceived competence, self-efficacy, and intrinsic motivation for PA, resulting in lasting behavioral and body habitus changes. Assessments included SDT-relevant putative moderators/mediators (e.g. exercise motivation, self-regulatory style), PA/exercise, dietary intake, and body weight/composition, with valid methodologies.

**Results:** One-year results (82% retention) show the following intervention-control differences: +85±54 min/wk of total PA (p=0.112), +1518±801 steps/day (p=0.060), -5.0±0.8 in % body weight change (p<0.001), -2.8±0.7 kg in body fat change (p<0.001), +6.3±2.9 g/d in dietary fiber change (p=0.032), and -4.3±1.0 for change in % energy from dietary fat (p=0.032). Importantly, effect sizes for SDT-based mediators were moderate to large (0.49 and 1.01, p<0.001), favoring intervention. Up-to-date results will be presented.

**Conclusion:** Self-Determination Theory and Motivational Interviewing have not previously been applied to weight management in an experimental, controlled design. Our findings indicate that this can be successfully implemented, resulting in meaningful changes in key variables, including the SDT mediators which are hypothesized to predict long-term success.

**Funding:** Science and Technology Foundation, Calouste Gulbenkian Foundation, Oeiras City Council, IBESA, Nestlé-Portugal.

## T4:PS:24

**Short-term appetite-reducing effects of a low-fat dairy product enriched in protein and fibre and consumed as a mid-morning snack**

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The aim of this study was to confirm the appetite-reducing effects of a marketed low-fat dairy product enriched in protein and fibre as shown in a first study including 24 women from the UK (Lluch et al, 2007)\*. A randomised, multicentric, cross-over design study was conducted in 121 healthy, normal and overweight, non-dieting women from France (mean age 32.1; mean BMI 25.0 kg/m<sup>2</sup>) in order to evaluate the effects of Shape Lasting Satisfaction<sup>®</sup> on subjective appetite and subsequent food intake. Two hours after the consumption of a standardised breakfast (190 kcal), subjects were given as mid-morning snack a commercial portion (120g) of either Shape Lasting Satisfaction<sup>®</sup> (6.6% protein, 2.2% fibre, 0.1% fat, 75kcal/serving) or a marketed low-fat control yoghurt (3.5% protein, 0.5% fibre, 1.1% fat, 85kcal/serving). Subsequent food intake at an *ad-libitum* lunch served 2 h after the snack was measured. Appetite sensations (hunger, fullness, desire to eat, prospective food consumption and satisfaction) were recorded throughout the morning and an integrated appetite score was calculated. Post-prandial appetite profiles were analysed by a repeated-measures ANOVA. Compared with the control, Shape Lasting Satisfaction<sup>®</sup> significantly reduced subjective appetite over the 2 hours following consumption (all p<0.001) and reduced subsequent energy intake (65kcal) (p<0.01). In conclusion, a low-fat yoghurt enriched in protein and fibre effectively reduced short-term appetite in healthy subjects, which could be helpful for daily appetite and weight management.

\* Lluch A et al. (2007) Subjective appetite-reducing effects of a low-fat dairy product enriched in protein and fibre. *Appetite* (abstract).

## T4:PS:23

**Correlation between fat, fiber and body mass index ( BMI) among premenopausal women those refers to medical centers of ITC (Information and Technology Company)**

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Shahid Beheshti University, Tehran, Iran

Correlation between fat, fiber and body mass index ( BMI) among premenopausal women those refers to medical centers of ITC (information and technology company)

**Background:** Overweight is one of the evidence complications of premenopausal period. Hormonal interference, food pattern and physical activity are effective factors. Following study had been done among referees to the medical centers of ITC in Tehran city aimed at determining the connection between BMI, fiber and fat intake.

**Method:** In this analytical\_descriptive study, all the information was measured by anthropometric indices likes weight,height,BMI,abdomin circumference and food frequency questioner (FFQ). Finally 40 healthy women were selected and adjusted according to the level of physical activity and their incomes.

**Result:** According to the results, 35% of participants were observed with high fat and 30% were low fiber consumers. Also 72% of the people got overweight (BMI≥25) and 80% found with abnormal abdomen circumference. While 37.5% of the latter enjoyed high fat and low fiber. on the contrary %62.5 used proper pattern of fat and fiber intake.

**Conclusion:** these findings shows that food pattern could be one of the important reason of overweight and fat concentration among premenopausal women, also obesity specially in abdomen area, observed among those who had proper intake of fat and fiber. It seems like hormonal interferences is the, main reason but more study is necessary in this field.

## T4:PS:25

**Determining Nutritional Knowledge, Attitude and Practice (KAP) in Female Employees of Tabriz University of Medical Sciences (Iran) and Educational Intervention in order to modify these Items**

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Women are more prone to nutritional deficiencies. Furthermore informing women about the basics of healthy eating will affect other family members, especially children, as well.

This is a cross-sectional, interventional study performed on 500 female employees of Tabriz University of Medical Sciences. Nutritional knowledge, attitude and practice of the subjects were determined by a questionnaire at the beginning. Then an educational intervention was performed in form of a lecture session plus distributing an educational booklet. Two months later, the efficacy of the intervention was re-assessed.

Before the intervention mean of nutritional knowledge was 17.69 which raised to 18.00 after education. Mean of nutritional attitude changed from 14.49 to 14.86 and mean of nutritional practice increased from 2.96 to 3.05. None of these changes were statistically significant (P-Values 0.225, 0.427 and 0.303 respectively).

In 68.6% of the participants the number of the meals taken daily were the same after the education and the changes which occurred were also statistically insignificant in any direction. 77.2% of the subjects did not change the pattern of their breakfast intake and though the changes that occurred were toward a better pattern there was no significant difference.

Our results clarified that in spite of the good knowledge level of the subjects, their practice was poor and lecture and booklet distribution alone were not effective in modifying the practice. Exploiting other educational methods such as discussion, consultation and newsletter and also individualizing the education with regards to the subject's educational level and occupation may improve the results.

## T4:PS:26

**Dance-therapy improves body image in obese patients**Muller-Pinget, S<sup>1</sup>, Carrard, I<sup>1</sup>, Golay, A<sup>1</sup><sup>1</sup>Service of Therapeutic Education for Chronic Diseases, University Hospital of Geneva, Switzerland

Dance therapy offers the opportunity for obese patients to practice exercise regularly and creatively, as well as working on the psychological aspect of their personality, their self-esteem and their body image. During this project, patients have been encouraged to discover and work on their body language in order to improve their body image.

**Method:** This pilot study included 10 patients meeting every week for 2 hours during 36 weeks. Patients were evaluated 3 times a year every 12 weeks. The patients worked on posture, conscious walking, observing and relaxing their tensions, and on expressing their mental representations of their body image through dance.

We developed a way of observing and analysing body movement: 4 self-questionnaires on posture, conscious walking, tensions and relaxation, 2 hetero questionnaires on motor dysfunctions and mental representation of their body image. Patients also had to fill in the Stunckardt scale on body image and the Coopersmith scale on self-esteem. Comparisons between the 3 times of evaluation were done with Friedman tests.

**Results:** Significant results were found on posture ( $p<.001$ ), conscious walking ( $p<.01$ ), tension ( $p<.01$ ) and relaxation ( $p<.01$ ). The scale on motor dysfunctions also showed significant improvements ( $p<.05$ ). Regarding standardized questionnaires, the Coopersmith social self-esteem improved ( $p<.01$ ) as well as the Stunckardt perceived body image ( $p<.05$ ).

**Conclusion:** The results showed that our developed scales are promising tools to evaluate dance therapy. Dance therapy helped obese patients to improve their self-esteem, body-image and to express themselves more easily about their sensations.

## T4:PS:28

**The Coaching Weigh: A new method of interaction with obese and overweight patients for health professionals.**Scholtz, M<sup>1</sup>, Schwartz, J<sup>2</sup>, Hottinger, G<sup>1</sup><sup>1</sup>NOVO Wellness LLC, Hendersonville, North Carolina, USA, <sup>2</sup>Emory University, Atlanta, Georgia, USA

Increasing evidence suggests that obesity treatment success requires not only effective eating and exercise strategies but behavioral modifications and increased self-efficacy. Typical treatments emphasize the health care professional as "expert"; a didactic, provider-centered method that has proved unsuccessful. Our purpose is to develop an improved communication style for health professionals working with the obese and overweight.

This coaching methodology integrates concepts from many areas including positive psychology, motivational interviewing, the Transtheoretical model of change, and appreciative inquiry. And it includes an important element of flexibility regarding patient expectations and individualization of each patient's plan. This respects the patient's pace and values and facilitates an evolution from weight loss to wellness focused. The concepts and methods will be presented in detail.

Our approach has been taught at two conferences of the IDEA Health and Fitness Association, to a multi-disciplinary clinical team at the University Hospital of Geneva, as part of dietetic internship programs at Georgia State University, Emory University, and Southern Regional Medical Center in Atlanta, GA, and published in the IDEA Personal Trainer periodical. It is part of an online tool used with over 30,000 members on several health/fitness and weight loss websites. And a randomized controlled trial in a University linked bariatric clinic will begin in early 2008 comparing coaching to a classic multidisciplinary clinical approach.

In response to the need for health professionals to acquire tools and attitudes to better work with obese patients, this novel coaching method holds important promise.

## T4:PS:27

**Increasing the motivation for physical activity in obese individuals**Schelling, S<sup>1</sup>, Munsch, S<sup>1</sup>, Meyer, AH<sup>1</sup>, Newark, P<sup>1</sup>, Margraf, J<sup>1</sup>, & Biedert, E<sup>1</sup><sup>1</sup>University of Basel, Basel, Switzerland

**Theoretical Background:** After behavioral weight loss treatment, weight is often regained. Physical activity turns out to be the strongest predictor of long-term weight loss. But only few obese individuals initiate physical activity and maintain their efforts. In this randomized controlled study, the efficacies of a standardized motivation intervention and a relaxation control intervention were compared with regard to increasing physical activity among obese individuals.

**Method:** 38 obese participants were randomly assigned to a one-session motivation or relaxation intervention. Thereafter, both groups participated in an 8-week aerobic program. Compliance, motivational stage of change, physical activity, and body mass index (BMI) were assessed during intervention, and at 3- and 6-month follow-up.

**Results:** Participants of the motivation intervention group attended significantly more aerobic exercise sessions than did participants of the relaxation intervention group and there were fewer dropouts. Moreover, weekly minutes of physical activity increased over time before leveling off, whereas steady decreases were observed in the relaxation group. For motivational stage of change and BMI no significant group differences were observed over time.

**Conclusion:** The results of our study underline the importance and efficacy of motivational interventions in enhancing the usually observed low compliance rates in obesity treatment. Further research should reevaluate the present findings in an enlarged sample size during long-term follow up.

## T4:PS:29

**The Relationship between Weight Loss Patterns and Changes in Health-Related Quality of Life**Kolotkin, RL<sup>1,2</sup>, Norquist JM<sup>3</sup>, Crosby, RD<sup>4,5</sup>, Suryawanshi S<sup>6</sup>, Teixeira PJ<sup>7</sup>, Heymsfield SB<sup>8</sup>, Erondy N<sup>6</sup> Nguyen AM<sup>7</sup><sup>1</sup>Obesity and Quality of Life Consulting, Durham, NC, USA, <sup>2</sup>Duke University Medical Center, Durham, NC, USA, <sup>3</sup>Merck Research Laboratories, North Wales, PA, USA, <sup>4</sup>Neuropsychiatric Research Institute, Fargo, ND, USA, <sup>5</sup>University of North Dakota School of Medicine and Health Sciences, Fargo, ND, USA, <sup>6</sup>Merck Research Laboratories, Rahway, NJ, USA, <sup>7</sup>Technical University of Lisbon, Lisbon, Portugal

We compared changes in health-related quality of life (HRQOL) over one year among overweight/obese individuals with different patterns of weight change (WC). Data were from 1246 participants in a RCT of an NPY-5R antagonist. At baseline, 12, 24 and 52 weeks, participants (86% female; 78% Caucasian) completed the Impact of Weight on Quality of Life-Lite (IWQOL-Lite) questionnaire and were weighed. Treatment group data were pooled because no meaningful differences in drug efficacy/safety were observed. Latent growth mixture modeling was used to identify patterns of WC, distinguished by timing/amount of weight loss/gain and presence/absence of weight regain. IWQOL-Lite changes over time were compared across WC patterns using growth curve analyses (GCA). Seven distinct WC patterns were identified using optimal fit statistics: 2 (5.1% of the sample) depicted significant weight loss (~12% at 24 weeks) followed by either weight regain or continued weight loss; 2 (34%) with moderate weight loss (~5-8%) followed by weight regain, 1 (44.4%) with no weight change, and 2 (16.5%) with initial weight gain (~3%) followed by subsequent loss or return to baseline. GCA revealed improvements in all IWQOL-Lite domains regardless of WC pattern, with the largest improvements in Self-Esteem. ANOVA revealed significant differences in HRQOL changes among WC patterns only for Physical Function ( $F=2.59$ ;  $p=.02$ ) and Total score ( $F=2.08$ ;  $p=.05$ ). While research has shown that moderate weight loss significantly improves HRQOL, these results indicate that further research is needed to better understand the impact of weight loss patterns on HRQOL and the possibility of a Hawthorne Effect.

**Funding:** Research relating to this abstract was funded by Merck & Co., Inc.

## T4:PS:30

**Evaluation of effectiveness of a Lifestyle Modification program on obesity based Lipid Profile in C.H.D Patients**Shahanfar J<sup>1</sup>, Aslanabadi N<sup>2</sup>, Shahamfar MR<sup>3</sup><sup>1</sup>Tabriz University of Medical Sciences, School of Medicine, Department of community medicine, Also Affiliated with National public Health management center (NPMC), Tabriz, Iran<sup>2</sup>Tabriz University of Medical Sciences, Department of Cardiology, Shahid Madani Heart Hospital, Tabriz, Iran<sup>3</sup>Tabriz University of Medical Sciences, School of Dentistry, Tabriz, Iran

**Background and Aims:** Coronary artery disease and stroke are the major killers in the world. According to the latest statistics around one million Americans experience heart attack each year. Improvement in the Quality of life and high Levels of patient Satisfaction are associated with cardiovascular risk reduction Program.

**Material and Methods:** We Evaluated effectiveness of a behavior educational intervention on reducing of Lipid profile in CHD patients. A total of 100 patients (50 experimental, 50 control) aged less than 65 years were recruited for this study. A behaviorally based lifestyle modification program was performed in Experimental group patients while control patients received ordinary hospital care.

**Setting:** Coronary Care unit, cardiology department, Shahid madani heart hospital, TABRIZ.

**Exclusion Criteria:** All severely ill patients, patients aged more than 65 years and those out of TABRIZ.

**Statistical analysis:** SPSS.12 software was utilized.

**Results:** The results of this study showed that LDL cholesterol levels decreased from mean of 146.07 mg/dl at baseline to 134.82 mg/dl after one year (P<0.05). Total cholesterol decreased from a mean of 211.94 at baseline to 188.86 mg/dl after one year (P<0.05) with 95% Confidence interval of the differences. HDL cholesterol Levels increased from 34.41 mg/dl to 38.43 mg/dl after modification of lifestyle. (P<0.05) Mean weight decreased from 77.45 at baseline to 73.88 after intervention. Waist/hip ratio decreased from 108.67 to 0.99 after education (p<0.05).

**Conclusion:** We found that the lifestyle modification program in experimental group can reduce the Lipid profile of patients without increasing cardiac morbidity and mortality.

**Key words** Coronary artery disease, Lifestyle, Lipid profile, modification.

**Funding:** Research related to this abstract was funded by vice chancellorship for research of Tabriz University of Medical Sciences.

## T4:PS:32

**Behavioural change and patient education: An interdisciplinary approach in the treatment of obese patients**

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It is a very common belief, that the battle against overweight is won primarily through increase of physical activity and reduction of food intake. Very often other issues such as psychological and social aspects are not given much attention.

There is increasing indication, that this, as well as societal prejudice, are reasons why many existing programs show low sustainability and quite humble success rates. Through clinical experience it becomes obvious that a mere functional approach, such as the well-known input/output model are not going to be efficient. Furthermore, short term treatment programs of only a few months do not take into consideration, that in order to achieve a sustained reduction and stabilization of weight long term changes in regards to life-style, relationship patterns, regulation of emotions and stress are required.

On the basis of this experience the multi professional and interdisciplinary out-patient treatment program "Adifit" at the University of Berne, Inselspital was developed. The treatment includes adequate medical therapy, psychological group counselling, nutritional counselling, somatic psychology and physical activity during a 36 months' program.

The workshop will present the structure and content of the program. Case examples will illustrate the multi professional team approach. Particular emphasis will be given to the transfer and integration of skills and insights –as they are discovered and practiced within a therapeutic context - into the everyday life of the patients. The experience of self-efficacy is seen as an essential prerequisite in dealing with the unavoidable setbacks and hurdles in the process of weight reduction.

## T4:PS:31

**Projects of Therapeutic Education for Chronic Patients in Romania**

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Therapeutic education takes its place among the revolutionary bio-psycho- social approach of the medical care in Romania. First used in diabetes care education, we literary struggle to initiate and perpetuate medical courses for primary care and ambulatory care medical services providers.

Our project –Therapeutic Education for Patients with Chronic Diseases - has been initiated the early 2007 and is developed now for three counties in Romania. The program has four "steps", each of them for three days, and it consists of interactive role playing, psychological group projects, evaluation tests and power point presentation of the main topics. We have involved psychologists, complementary therapists, actors, drama artists and musicians.

We gather experience every day within chronic patients with obesity, diabetes, and alcoholism. We have organized support groups for patients (alcoholism and obesity), and also we have introduced a new form of support group, "mixed" with patients and doctors, - a group that we use in all interactive work groups to illustrate and exemplify for example the roles in the "dramatic triangle", or the spontaneous attitudes from the medical check ups.

## T4:PS:33

**Demand of food supplements: a survey in the pharmacies of the province of como.**<sup>1</sup>Vanotti, A, <sup>2</sup>Masserini, M<sup>1</sup>U.O. Nutrizione Clinica e Dietetica ASL Provincia di Como, <sup>2</sup>Scuola di Specializzazione in Scienza dell'Alimentazione dell'Università di Milano

**Objective:** To assess the request of well-being of the citizens by the demand of food supplements and the possible role played by pharmacists in nutrition education.

**Design:** Questionnaires presented to consumers by pharmacists.

**Setting:** Pharmacies in the city of Como (Northern Italy) and the surrounding province.

**Participants:** 262 subjects aged 16-80 years.

**Variables Measured:** The characteristics of persons purchasing food supplements, the reasons for the purchase, the information driving their choice.

**Analysis:** Verbatim interviews were coded and analyzed by chi-square.

**Results:** The most frequent request of food supplements was for "Overweight" in females, while in males "sports" and "overweight" were comparable. A seasonal variability of the requests was also observed. About 50% the individuals reporting overweight problem were actually normal weight or even underweight on the basis of the body mass index. The advice of friends/acquaintances, and not of advertising, was driving the request of a specific supplement. The sale was always accompanied by the pharmacists' advice, that was always accepted.

**Conclusions and Implications:** The request of food supplements to the pharmacists is not always objectively justified. If adequately trained/updated, pharmacists can act as active providers of nutritional education and collectors of epidemiological data.

**Keywords:** food supplements, survey, pharmacists, overweight

## T4:PS:34

**Testing a new self-report instrument for measuring lifestyle physical activity in obese women**

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**Goal:** To evaluate a new self-report instrument for measuring lifestyle, light, moderate, and vigorous physical activity (PA), by comparison with an accelerometry-based activity monitor, after a behavioral weight management program in overweight/obese women.

**Methods:** 94 women (age, 39.3±6.5 y; BMI, 29.3±4.9 kg/m<sup>2</sup>) were measured at program's end. Assessments included light, moderate and vigorous PA with the Actigraph GT1M and a newly-developed instrument, the Obesity-specific Physical Activity Recall (Ob-PAR), which provides increased detail within different intensity levels. This questionnaire includes a separate lifestyle PA scale. The agreement between Ob-PAR and accelerometry was explored by Spearman rank-order correlation and Bland-Altman analysis.

**Results:** Comparing the Ob-PAR lifestyle scale with accelerometry, lifestyle PA was associated with light (min/wk) ( $\rho=0.282$ ;  $p=0.001$ ) and moderate PA (min/wk) ( $\rho=0.231$ ;  $p=0.004$ ) from accelerometry. Contrarily, the Ob-PAR lifestyle PA scale was negatively correlated ( $\rho=-0.218$ ;  $p=0.056$ ) with sedentary behavior evaluated from accelerometry. Moderate PA ( $\rho=0.267$ ;  $p=0.019$ ) and vigorous PA ( $\rho=0.252$ ;  $p=0.028$ ) from Ob-PAR were correlated with moderate and vigorous PA from accelerometry, respectively. Using the Bland-Altman analysis, Ob-PAR was found to overestimate moderate (+48.2±64.1 min/day) and vigorous (+23.8±54.8 min/day) PA, compared with accelerometry ( $p<0.001$ ). Significant trends ( $p<0.001$ ) were observed between the differences of the methods and the mean of both methods, indicating underestimation at lower PA levels and overestimation at higher levels.

**Conclusion:** The Ob-PAR lifestyle scale may be a useful tool to measure low intensity/light activities. In general, however, the main Ob-PAR questionnaire appears to overestimate PA when compared with an objective measure, displaying large limits of agreement.

**Funding:** Fundação Ciência e Tecnologia, Fundação Calouste Gulbenkian, Câmara Municipal de Oeiras IBESA, Nestlé, Portugal

**Key Words:** Lifestyle Physical Activity, Accelerometry, Self-Report, Behavioral Program, Obesity

## T4:PS:36

**Two year outcome for a cohort of 40 subjects following the long term maintenance element of the LighterLife Programme**

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It is recognised that obese individuals who lose weight using various approaches often regain weight over the ensuing few years. LighterLife is a commercial weight management programme for those with BMI >29kg/m<sup>2</sup> initiating weight loss via a nutritionally complete Very Low Calorie Diet (VLCD), as well as Transactional Analysis and Cognitive Behavioural Therapy techniques (TCBT) specifically developed for behavioural modification in weight management. Following weight loss, there is an ongoing weight maintenance programme with continued support helping patients implement and sustain further healthy lifestyle changes.

**Aim:** To determine weight maintenance outcomes two years after weight loss in a cohort of 40 women.

**Method:** Initial weight loss data was collected by LighterLife Counsellors on a weekly basis and 2 years (+/- 12 weeks) after weight loss.

**Results:** Mean start weight 97.4Kg Mean initial weight loss 26.5Kg Two years after initial weight loss

Maintained weight	
at least 5% below start weight	82.5%
at least 10% "	72.5%
at least 50% "	62.5%
at least 80% "	20 %

**Conclusion:** 2 years after losing weight on the LighterLife programme, 82.5% maintain at least 5% and 72.5% maintain at least 10% of initial weight loss and may continue to benefit from reduced co-morbidities associated with weight loss. Further studies will be carried out to determine the outcome of those who do and do not avail themselves of the long term weight maintenance support offered by LighterLife.

## T4:PS:35

**A new biopsychosensorial nutritional approach for obese patients**

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The objective of this programme was to help patients become aware of the possibility of a better perception (hunger, gustative pleasure and satiety) and to evaluate its impact on eating behaviour and body weight.

During a 10 days interdisciplinary weight loss programme, 19 hospitalized obese patients have received a training to enable them to perceive hunger, gustative pleasure and satiety. A self-evaluation grid containing the following elements has been used: eating pattern, meal context, eating desire and cognitive restrictions. A food interview and a questionnaire have been done before and after the hospitalization and 3 months after.

At 3 months: 89% improved their eating pattern; 47% improved their eating conditions; 10% rediscovered hunger; 16% managed better their eating desire; 21% reintroduced more flexibility in eating pattern; 37% rediscovered gustative pleasure and 39% satiety; 10% stopped feeling a postprandial heaviness; 26% felt more confident and self-efficient in weight management. Consequently, body weight was reduced for 68 % of the patients, stable for 21 % and increased for 11 %.

In conclusion, sensorial workshops as part of a therapeutic education programme for obese patients contribute to the rediscovery of gustative pleasure and food sensations as well as to an increased patient autonomy in weight management.

## T4:PS:37

**Depression level and the duration of complex, group weight-reducing program**

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**Introduction:** Many of the patients resign from the weight-reducing therapy shortly after the start. Both external (lack of family support) and internal factors (lack of motivation, depression) may exert the influence on the subjects. The aim of the study was to assess the influence of depression level on the time of continuation of the complex, group, weight-reducing program.

**Patients and methods:** 217 obese subjects starting three-month complex, group weight-reducing therapy were included into the study (age 45.8 ± 14.1 y, BMI 36.8 ± 7.4 kg/m<sup>2</sup>, weight 98.6 ± 18.4 kg). The Beck's questionnaire was used to assess depression level.

**Results:** No significant correlations between the time of the continuation of the weight-reducing therapy and age, body weight and depression level were observed.

Resignation	I meeting	II meeting	III meeting	IV meeting	V meeting	End
N	23	31	26	13	25	100 (46 %)
Age (years)	44.2 ± 14.3	44.3 ± 14.6	43.6 ± 14.2	46.0 ± 21.2	46.8 ± 18.5	48.0 ± 13.6
Body weight (kg)	98.0 ± 20.5	101.1 ± 16.6	102.0 ± 15.7	95.6 ± 25.6	98.0 ± 19.3	97.6 ± 17.8
BMI (kg/m <sup>2</sup> )	36.5 ± 7.2	36.6 ± 4.7	38.5 ± 5.5	41.6 ± 20.7	38.8 ± 14.0	36.7 ± 8.3
Depression level (points)	15.3 ± 9.7	9.7 ± 7.5	14.7 ± 8.3	23.3 ± 24.3	16.9 ± 19.4	13.2 ± 12.5

**Conclusion:** Depression level does not alter the time of continuation in the complex, group, weight-reducing therapy.

## T4:PS:38

**The Influence of the Family Core on Obesity – Quantification of the Behavioural Factors**C. Panaite<sup>1</sup>, A. Potarniche<sup>1</sup>, A. Dragomir<sup>1</sup>, B. Ion<sup>2</sup>, D. Cheta<sup>1</sup><sup>1</sup>N. Paulescu Institute of Diabetes, Nutrition And Metabolic Diseases, <sup>2</sup>Psychology Faculty, Bucharest University

Obesity has multiple causes, both the genetic predisposition on metabolism and the regulatory component of the feeding behavior playing important roles.

**Materials and methods:** 84 families (medicine students and their parents) were included in this study. The mean age of the students (56 girls and 28 boys) was 23,5±1,2; for the parents was 47,5±7,2. The BMI of the females was 23,2±3,4 Kg/m<sup>2</sup>, and for the males was 23,3±4,6 Kg/m<sup>2</sup>. Both the students and their parents were asked to complete the 3 Factor Eating Questionnaire - 18 questions. The questionnaire generates 3 scores: cognitive restraint, uncontrolled eating and emotional eating.

**Results:** The following variables were associated with the risk of being overweight or obese – obese father (p<0,01), obese mother (p<0,05), both parents obese (p<0,01). Family history of obesity was a predictive factor (OR=3,1; CI=1,8-7,2). From the 3FEQ-18 data, an association for cognitive restraint inheritance was observed (p<0,05), in students of both sexes. Emotional eating seems to be associated with the inheritance from both mother and father in female students.

**Conclusions:** The attempt to quantify the behavioural component of obesity, learned within the family core, confirms the contribution of the psychological factors to inheriting the predisposition for obesity and a certain pattern. Research has to be extended to other subpopulations in order to avoid selection bias.

Research related to this abstract was funded by the TD 270/2007 grant.

## T4:PS:40

**Art therapy for patients suffering from obesity**Anzules, C<sup>1</sup>, Haenni C<sup>1</sup>, Antonietti, F<sup>1</sup>, Golay, A<sup>1</sup><sup>1</sup>University Hospitals of Geneva, Switzerland

Art-therapy is integrated in a multidisciplinary patient therapeutic education programme including cognitive-behavioural psychotherapy, medical treatment, dietetics and physical activity.

Obese patients dislike their fatness and tend to avoid the sensations it brings, inducing a body denial.

The working hypothesis is that by awakening the body and mobilising all the senses, obese patients can grow more aware of their own resources, express their experiences in different ways and encourage a more positive self-esteem.

Thirty obese patients suffering from eating disorders took part in the art-therapy programme. The art-therapy workshops take place over a period of twelve weeks with a weekly session of two hours. Each session is broken down into three phases.

The first phase helps the patient to become aware of his body. The second phase brings the bodily sensation to creative art-work. The third phase is a verbal expression about the pictorial art-creation.

The workshops are evaluated using three forms: quantitative with the Coopersmith's Self Esteem Inventory (SEI), qualitative with semi-structured interviews, and expressive with an expressive evaluation tool created in order to observe patients' emotional and sensory experiences at the beginning and end of the workshops.

The results of Coopersmith's S.E.I. showed moderate and clinically significant improvement (p<0.01). During semi-structured interviews carried out two months after the workshops, patients expressed their experiences. Through their words, we were able to determine what participation had awoken and provoked within them.

In conclusion, participating in an art-therapy workshop gives patients access to their own resources, reinforces their own personalities and improves their self-esteem.

## T4:PS:39

**Education-part of managing of “difficult patient” with Diabetes mellitus**

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Patient education is recognized worldwide as a major tool for the efficient treatment of diabetes mellitus. Physicians frequently spend much more time speaking about the disease than helping the patient learn about the daily management of diabetes.

**Aim:** Therapeutic patient education with “The Bonsai approach”- evaluation of glycemic control.

The questionnaire has been developed to assist diabetes educators in meeting the challenge of efficiently and effectively educating of difficult Type2 diabetes mellitus patients.

**Material and methods:** 34 noncomprehensive ps with Type 2 DM was educated individually /3 times per week/ and compare with 30 noneducated ps with DM. BMI, Fasting blood glucose, Hb A1c, lipids profile, blood pressure; Quality of life was assessed before and after course. **Results:** BMI decreased from 36 to 31 % and HbA1C- from 8,6% to 7,2% following education in non comprehensive ps.

**Conclusion:** Therapeutic patient education implies the development of appropriate strategies in order to help patient s learn the specific skills for daily metabolic control, the correct management of hypo glicemia, the prevention of long-term complications.

## T4:PS:41

**Experience in psychological-nutritional group counseling**Belova, E<sup>1</sup>, Tarasova, I<sup>1</sup>, Ionova, L<sup>1</sup>, Zlatinskaya E<sup>2</sup><sup>1</sup>Medical Center “Dr. Ionova’s clinic”, Moscow, Russia

The study “A comparison of the efficiency of weight loss treatment upon long-term individual and group counseling” was started. In the context of this study, weight loss treatment was provided via group counseling. The number of patients - 10 (2 men, 8 women), aged 25-45, body weight- 67.7-90 kg, BMI- 27-34 kg/m<sup>2</sup>. Tutors – a dietitian and a clinical psychologist. Duration of group counseling – 10 sessions for 2 hours during 10 weeks. During the first session, body weight, height and body composition analysis were determined. Based on a nutrition pyramid, the food ration was developed (1200-1400 kcal); individual and group goals were set. Subsequent sessions included estimation of body weight and composition, brief analysis of the previous week, required nutritional information and psychological exercises. Following each session, the patients received a home task. Special copybooks were prepared for the patients to do their homework in. For psychological counseling, a combination of CBT, Art Therapy and Gestalt Therapy methods was employed. The final session was held at a restaurant to analyze the acquired habits of choosing food and dishes in real life.

As a result, the average weight loss in the group was 5.2 kg, new eating habits were acquired, own needs were referred to and vital activity increased. Although the study is still in progress, it can already be said that a psychological-nutritional group counseling is an effective mode of weight loss treatment; it is a highly efficient method of work with the patients in the long-term weight loss program.

## T4:PS:42

**Weight loss results for 5000 women following the LighterLife Programme in 2007**

Hallam Spencer C.L, Holt J, du Plessis J, Cox J.S.A, Hewlett B.

LighterLife, Cavendish House, Harlow. UK

Maintained weight loss of just 5-10% can reduce the risk of co-morbidities for obese individuals. LighterLife is a commercial weight management programme for those with BMI >29kg/m<sup>2</sup> initiating weight loss via a nutritionally complete Very Low Calorie Diet (VLCD), as well as Transactional Analysis and Cognitive Behavioural Therapy techniques (TCBT) specifically developed for behavioural modification in weight management. Following weight loss, there is an ongoing weight maintenance programme with continued support helping patients implement and sustain further healthy lifestyle changes.

**Aim:** To determine mean average weight loss results for women following the first stage of the LighterLife Programme in 2007.

**Method:** Weekly weights are recorded by LighterLife Counsellors onto a central database. Data was collated for a random sample of 5000 clients who started and completed at least 14 weeks of the LighterLife Programme in 2007.

**Results:**

Mean start weight	100.1kg
Mean start BMI	37.2kg/m <sup>2</sup>
Mean weight loss after 14 weeks	19.3kg
Mean % weight loss	19.4%
Mean BMI reduction	7.2kg/m <sup>2</sup>

**Conclusion:** The LighterLife Programme can successfully assist obese women to lose in excess of 10% of their body weight within 14 weeks, which in turn may lead to improvements in co-morbidities.

## T4:PS:44

**The effects of abstinence from boiled coffee on serum cholesterol in healthy and overweight adults**Mraovic T<sup>1</sup>, Gligorijevic J<sup>2</sup>, Nikolic M<sup>3</sup>, Mioljevic V<sup>4</sup><sup>1</sup>Department of Nutrition, Military Medical Academy, Belgrade, Serbia,<sup>2</sup>Department of Nutrition, Clinical Center of Serbia, Belgrade, Serbia, <sup>3</sup>Faculty of Medicine, University of Nis, Serbia, <sup>4</sup>Department of Epidemiology, Clinical Center of Serbia, Belgrade, Serbia

**Objective:** Earlier studies and trials have shown a serum cholesterol raising effect of diterpenes: cafestol and kahweol in boiled coffee (Turkish coffee). The objective of this study was to assess the effects of the abstinence from boiled coffee on serum cholesterol level in healthy and overweight adults.

**Subjects and methods:** A prospective, controlled, intervention, clinical trial was performed. A total of 39 healthy volunteers (18 overweight, BMI>25 kg/m<sup>2</sup> and 20 normal weight BMI<25kg/m<sup>2</sup>), aged 30-50 years, completed the trial. Before the trial all of them consumed four to eight cups of Turkish coffee per day (300-700 mg caffeine per day), for more than 10 years. During the trial period (duration 8 weeks) they were asked to consume no coffee and not to change diet and lifestyle.

**Results:** At the beginning of trial, total cholesterol serum concentration was 5.64±0.96 mmol/L in normal weight volunteers and 6.57±1.23 mmol/L in overweight volunteers. In both normal weight and overweight participant, abstinence from boiled coffee for 8 weeks was associated with a decrease in the total cholesterol serum concentration of 0.67±0.71 mmol/L (t=4.009; p=0.0009; p<0.001, <sup>2</sup>=2.92; p=0.087; p<0.1) and 0.74±0.75 mmol/L (t=4.392; p=0.0003; p<0.001) respectively.

**Conclusion:** Coffee consumption abstinence for 8 weeks is associated with decrease in total cholesterol concentration in both normal weight and overweight adults but health effects was statistically significant only in normal weight group.

## T4:PS:43

**Weight loss results for 1000 males following a male specific weight management programme in 2007**

Hallam Spencer C.L, Holt J, du Plessis J, Cox J.S.A, Hewlett B.

LighterLife, Cavendish House, Harlow. UK

Maintained weight loss of just 5-10% can reduce the risk of co-morbidities for obese individuals. Uptake onto weight management programmes is typically lower for men. LighterLife is a commercial weight management programme for those with BMI >29kg/m<sup>2</sup> initiating weight loss via a nutritionally complete Very Low Calorie Diet (VLCD), as well as Transactional Analysis and Cognitive Behavioural Therapy techniques (TCBT) specifically developed for behavioural modification in weight management. Following weight loss, there is an ongoing weight maintenance programme with continued support helping patients implement and sustain further healthy lifestyle changes. In 2007, LighterLife launched a programme tailored specifically for male clients, considering motivating factors and barriers for men.

**Aim:** To determine mean average weight loss results for men following the LighterLife Programme in 2007 since the launch of a male specific programme.

**Method:** Weekly weights are recorded by LighterLife Counsellors onto a central database. Data was collated for a random sample of 1000 clients who started and completed at least 8 weeks of the LighterLife for men Programme in 2007.

**Results:**

Mean start weight	121.3kg
Mean start BMI	38.0kg/m <sup>2</sup>
Mean weight loss after 8 weeks	17.5kg
Mean % weight loss	14.5%
Mean BMI reduction	5.5kg/m <sup>2</sup>

**Conclusion:** The LighterLife for men Programme can successfully assist obese men to lose in excess of 10% of their body weight in 8 weeks, which in turn may lead to improvements in co-morbidities.

## T4:PS:45

**LighterLife clients' self-reported ratings of general health and wellbeing: ease of walking one mile**

Mullins G, Holt J, Hallam Spencer C.L, du Plessis J, Cox J.S.A, Hewlett B.

LighterLife, Cavendish House, Harlow. UK

It is well understood that obesity can have a significant impact on an individual's health and wellbeing, which can in turn impact on day-to-day life. LighterLife is a commercial weight management programme for those with BMI >29kg/m<sup>2</sup> initiating weight loss via a nutritionally complete Very Low Calorie Diet (VLCD), as well as Transactional Analysis and Cognitive Behavioural Therapy techniques (TCBT) specifically developed for behavioural modification in weight management. Following weight loss, there is an ongoing weight maintenance programme with continued support helping patients implement and sustain further healthy lifestyle changes.

**Aim:** To determine changes in self-reported ability and ease of walking one mile during 2<sup>nd</sup> and 13<sup>th</sup> week of the LighterLife Programme

**Method:** A sample of 100 female LighterLife clients who completed the LighterLife Programme between March 06 and June 07 filled in questionnaires to rate basic markers of general health and wellbeing, including self-perceived difficulty in walking one mile, during the 2<sup>nd</sup> and 13<sup>th</sup> weeks on the LighterLife Programme. During that time their weight reduced by an average of 15kg.

**Results:**

Walking 1 mile	Very easy	Manageable	Difficult	Not manageable	Not given
Week 2	29%	44%	18%	6%	4%
Week 13	54%	28%	12%	4%	2%

**Conclusion:** Having lost an average of 15 kg a higher % of clients reported that walking one mile was 'very easy' at week 13 compared with week 2 on the LighterLife Programme.

## T4:PS:46

**LighterLife clients' self-reported ratings of general health and wellbeing: ease of climbing stairs**

Mullins G, Holt J, Hallam Spencer C.L, du Plessis J, Cox J.S.A, Hewlett B.

LighterLife, Cavendish House, Harlow. UK

It is well understood that obesity can have a significant impact on an individual's health and wellbeing, which can in turn impact on day-to-day life. LighterLife is a commercial weight management programme for those with BMI >29kg/m<sup>2</sup> initiating weight loss via a nutritionally complete Very Low Calorie Diet (VLCD), as well as Transactional Analysis and Cognitive Behavioural Therapy techniques (TCBT) specifically developed for behavioural modification in weight management. Following weight loss, there is an ongoing weight maintenance programme with continued support helping patients implement and sustain further healthy lifestyle changes.

**Aim:** To determine changes in self-reported level of difficulty in climbing stairs during 2<sup>nd</sup> and 13<sup>th</sup> week of the LighterLife Programme

**Method:** A sample of 100 female LighterLife clients who completed the LighterLife Programme between March 06 and June 07 filled in questionnaires to rate basic markers of general health and wellbeing, including self-perceived difficulty in climbing stairs, during the 2<sup>nd</sup> and 13<sup>th</sup> weeks on the LighterLife Programme. During that time their weight reduced by an average of 15kg.

**Results:**

Climbing 1 flight of stairs	Very easy	Manageable	Difficult	Not given
Week 2	29%	54%	17%	0
Week 13	72%	25%	2%	1%

**Conclusion:** Having lost an average of 15 kg a higher % of clients reported that climbing stairs was 'very easy' at week 13 compared with week 2 on the LighterLife Programme

## T4:PS:48

**From diet to life-style**

T. Persichetti, S. Pierangeli, M.R. Bollea

Clinical Nutrition, Dept. Internal Medicine, University of Rome "Tor Vergata"

Obese people keep on living diet as a temporary and extraordinary phase of life, either as a punishment or a deprivation, with negative drawbacks on motivation and self-esteem.

At the Clinical Nutrition out-patients dept of Policlinico Tor Vergata in Rome, a therapeutical group intervention has been recently activated, with the supervision of a psychologist and a dietist.

The "here and now" focus of this intervention is aimed to stimulate a greater awareness of food use,

to ricollocate nutrition in its originary and adaptive function with the aid of self-esteem improvement strategies, and to re-educate to an healthy nutrition and a correct life style.

Selected patients (25 ≥ BMI ≥ 30), coming from numerous unsuccessful dietetic attempts, undergo a psychological examination and self-administrated tests (SCL90r, EAT26, BUT).

If eligible they are included in "Lifestyle" groups (6-8 subjects). Patients undergo retests during the 8 weekly meetings (60 minutes each) and the 3 control meetings scheduled.

In 2007, 28 obese subjects out of 32 enrolled, completed all the steps.

Comparing scores, an improvement of the general mood has become apparent, with a remarkable diminishing of anxious states and an improvement of body perception, even in absence of conspicuous weight loss.

8 patients exhibited a significant weight loss.

Every participant recognized a changing in the way of assessing Obesity, not as a cause but as an effect.

In conclusion, a positive answer relative to the possibility of changing has been observed in this, although not representative, sample of patients.

## T4:PS:47

**LighterLife clients' self-reported ratings of general health and wellbeing: frequency of tiredness**

Mullins G, Holt J, Hallam Spencer C.L, du Plessis J, Cox J.S.A, Hewlett B.

LighterLife, Cavendish House, Harlow. UK

It is well understood that obesity can have a significant impact on an individual's health and wellbeing, which can in turn impact on day-to-day life. LighterLife is a commercial weight management programme for those with BMI >29kg/m<sup>2</sup> initiating weight loss via a nutritionally complete Very Low Calorie Diet (VLCD), as well as Transactional Analysis and Cognitive Behavioural Therapy techniques (TCBT) specifically developed for behavioural modification in weight management. Following weight loss, there is an ongoing weight maintenance programme with continued support helping patients implement and sustain further healthy lifestyle changes.

**Aim:** To determine changes in self-reported frequency of tiredness during 2<sup>nd</sup> and 13<sup>th</sup> week of the LighterLife Programme

**Method:** A sample of 100 female LighterLife clients who completed the LighterLife Programme between March 06 and June 07 filled in questionnaires to rate basic markers of general health and wellbeing, including self-perceived frequency of tiredness, during the 2<sup>nd</sup> and 13<sup>th</sup> weeks on the LighterLife Programme. During that time their weight reduced by an average of 15kg.

**Results:**

Frequency of tiredness	Never	Occasionally	Frequently	Always	Not given
Week 2	6%	41%	43%	9%	1%
Week 13	15%	76%	8%	1%	0%

**Conclusion:** Having lost an average of 15 kg a higher % of clients reported occasional tiredness rather than frequent tiredness at week 13 compared with week 2 on the LighterLife Programme

## T4:PS:49

**Influence of intensive insulin therapy on body mass index and metabolic control in adolescents with type 1 diabetes mellitus**Plavsic, Lj<sup>1</sup>, Simic, S<sup>1</sup>, Mitrovic, K<sup>1</sup>, Zdravkovic, D<sup>1,2</sup>

<sup>1</sup> Mother and Child Health Care Institute of Serbia, Belgrade, Serbia, <sup>2</sup> University of Belgrade, School of Medicine, Belgrade, Serbia

**Background:** Weight gain in adolescents with type 1 diabetes mellitus (T1DM), especially girls on intensive insulin therapy, has been repeatedly reported. The main goal of intensive regimen is achieving better metabolic control.

**Aim:** Influence of intensive insulin therapy on body mass index (BMI) and metabolic control in adolescents with T1DM who have poor metabolic control.

**Methods:** We have studied 94 adolescents aged 12 – 19 years on conventional insulin therapy with 2-3 daily injections, who have poor metabolic control: 44 (46.8%) girls with BMI 19.16 ± 3.60 kg/m<sup>2</sup> and 50 (53.2%) boys with BMI 19.04 ± 2.31 kg/m<sup>2</sup>. Metabolic control was assessed by measurement of glycosylated hemoglobin (HbA<sub>1c</sub>).

**Results:** BMI standard deviation score was higher in boys (0.16 ± 1.81) compared to girls (-0.07 ± 1.49) on conventional therapy and it was significantly higher a year after starting intensified regimen in both (boys 0.38 ± 2.09 and girls 0.42 ± 2.15). HbA<sub>1c</sub> in girls was 10.23 ± 2.18% before and 9.69 ± 2.35% a year after onset of intensive insulin therapy, while boys had HbA<sub>1c</sub> 9.79 ± 2.04% before and 9.54 ± 1.86% a year later. There was no significant positive correlation between BMI and HbA<sub>1c</sub> before and year after onset of intensive therapy.

**Conclusions:** Intensive insulin treatment improves metabolic control in adolescents with T1DM, but it is often related to weight gain. There is a need for more effective prevention of obesity in adolescents with T1DM on intensive insulin therapy.

**T4:PS:50****A new patient education obesity program adding up the advantages of group and individual sessions.**

Barthassat, V<sup>1</sup>, Schwarz, V<sup>1</sup>, Garcia, M<sup>1</sup>, Harsch-Bobbioni, E<sup>1</sup>, Amati, F<sup>1</sup>, N'Guyen, M<sup>1</sup>, Golay, A<sup>1</sup>

<sup>1</sup>Service of Therapeutic Education for Chronic Diseases, University Hospitals of Geneva, Switzerland

**Context:** Obese patients often experiment numerous weight loss. As a matter of fact, there are various ways to lose weight. To ensure body weight maintenance, however, a change of deeply entrenched behaviours needs to take place. Change requires motivation, awareness, time, learning and support.

We describe here a patient centred therapeutic education program taking into account the complex needs of obese patients and of their caregivers.

**Description:** This 2 years program offers both individual and in group follow-up. Through the group sessions, we favour the sharing of experiences, mutual support and confrontation of knowledge. The individual sessions allow an analysis of the patient needs, a personalization of the objectives, a respect for the patient rhythm, and a support to help the patient understand his or her functioning.

Our interdisciplinary program consists of 5 dimensions: medical, dietetic, psychological, physical activity and body perception. During the first year, patients benefit from an individual follow-up combined with 9 one-day motivational workshops in group. At the start, patients commit themselves to participate to all of the planned activities. This commitment allows us to work with a close group which elicits confidence and mutual respect. During the second year, we consolidate changes, work on patient autonomy and prepare a follow-up into an external network.

**Perspectives:** We are evaluating our ongoing program with biological, psychosocial, behavioural and nutritional data in order to correlate weight loss with habits changes and new skills. We search to identify predictive factors influencing long term weight loss maintenance.

**T4:PS:52****Obesity indices and weight loss in patients with type II diabetes and their relations to glycemetic control and complications of the disease.**

Kyriazis A. I.<sup>1</sup>, E. Zervas<sup>2</sup>, A. Fortis<sup>1</sup>, D. Mytas<sup>2</sup>, A. Lalousis<sup>2</sup>, A. Diakoumopoulos<sup>2</sup>, G. Christodoulou<sup>2</sup>, Z. Katsare<sup>2</sup>, K. Klimatsaki<sup>1</sup>, E. Deda<sup>2</sup>, D. Presvelos<sup>2</sup>, Ch. Partheniou<sup>2</sup>.

<sup>1</sup>Obesity Outpatient Clinic Korinthos General Hospital, Korinthos, Greece.

<sup>2</sup>Internal Medicine Dpt., Korinthos General Hospital, Korinthos, Greece.

**Introduction:** Sex Specific Central Obesity(SSCO) and obesity are the main modifiable risk factors for type 2 diabetes(T2D).

**Aim:**To study the incidence of obesity indices and weight loss effects and their relations to control and complications of the disease.

**Materials and methods:** The study included patients with T2D who were followed up in our Diabetic Center from 2002 to 2006. Height, weight, waist circumference were measured while the body mass index(BMI) and sex specific central obesity(SSCO) were estimated, as well as waist/hip ratio. Furthermore, blood samples were collected for HbA<sub>1c</sub>. Macro- and microangiopathy complications of diabetes were also estimated according to international criteria. Statistical analysis was done using SPSS 10.01. Differences were considered significant, if p < 0.05.

**Results:** A total of 813 patients(365 men, 448 women, mean age 65,56 ± 0,4 years) were studied, with a mean duration of diabetes 12,7 ± 0,3 years. 37,7% were obese, 42,3% overweight, 72,3% had SSCO and 54,8% had high waist/hip ratio. HbA<sub>1c</sub> levels were positively correlated with BMI levels(p<0,01 r=0,12) but not with waist or waist/hip ratio. Neither obesity, SSCO or waist/hip ratio associated with macro- or microangiopathy complications of diabetes in our diabetic population. Weight loss in the previous 6 months was associated with better diabetes control(HbA<sub>1c</sub> 6,9 ± 0,1 Vs 7,3 ± 0,1).

**Conclusions:** In persons with diabetes, chronic hyperglycemia is related to the development of microvascular disease. Ongoing clinical trials, suggest that improvements in glycemetic control may also lower the risk for cardiovascular disease. Obesity is one major modifiable risk factor for glycemetic control.

**T4:PS:51****The experience of illness. Stories of obese people.**

Charmillot, M<sup>1</sup>, Lasserre-Moutet, A<sup>2</sup>, Lagger, G<sup>2</sup>, Golay, A<sup>2</sup>

<sup>1</sup>Comprehensive Approach of representation and action, Sciences of Education, Geneva University, Switzerland, <sup>2</sup>Service of Therapeutic Education for Chronic Diseases, University Hospitals of Geneva, Switzerland

The purpose of this communication is to report of the life experience of obese people. Do they define their obesity as an illness, a problem, an injustice ? Do they apprehend their obesity as a break in their life or more as a continuum? Is the obesity seen as something they have to fight against or as an event which could potentially give a meaning to their life? Has the obese person the feeling she has to put up with her obesity or does she think that she has the resources to face it, and which (material, medical, relationships, symbolic...)? To what kind of therapeutic paths does obesity lead? These are the questions organising the framework of this comprehensive research. Considering the definition of illness as a "complete social fact", the point of view developed here exceeds the conception of illness as subject of observation in order to give an account of the "body-subject", the body "that can neither be submitted entirely to the rationality of the other, nor correspond perfectly to the theories and tools used by professionals". It is a question of taking into account the meaning of the experience of illness and suffering by giving room to the word and knowledge inherent to the ill person seen as a human being inextricably peculiar and social. The results coming from the analyses of ten thorough interviews conducted during the exploratory phase of our research allow to present a typology of the experience of obesity.

**T4:PS:53****The role of carers in weight loss interventions for adults with intellectual disabilities**

Melville, C.A.<sup>1</sup>, Miller, S.<sup>3</sup>, Boyle, S.<sup>4</sup>, Robinson, N.<sup>3</sup>, Pert, C.<sup>3</sup> and Hankey, C.R.<sup>2</sup>

<sup>1</sup>Psychological Medicine, University of Glasgow, U.K., <sup>2</sup>Human Nutrition, University of Glasgow, U.K., <sup>3</sup>Glasgow Learning Disabilities Partnership, U.K., <sup>4</sup>NHS Greater Glasgow and Clyde, U.K.

**Introduction:** Adults with intellectual disabilities have a higher prevalence of obesity than the general population. Since carers supporting adults with intellectual disabilities have been shown to play a part in implementing weight loss interventions, this study examines paid carers' training needs relevant to lifestyle changes.

**Methods:** An interviewer administered questionnaire was used to examine paid carer knowledge of public health recommendations on diet and physical activity; perceptions of the benefits of healthy diets and physical activity levels; and the carer views on the barriers to change experienced by individuals with intellectual disabilities.

**Results:** A total of 78 carers took part in the study. Overall paid carers have a low level of knowledge around public health recommendations on diet and physical activity. Paid carers are significantly more likely to have full knowledge of the public health recommendation for consumption of fruit and vegetables than that for physical activity (chi<sup>2</sup>= 21.8, p<0.001). Greater importance is attributed to the benefits of diet than physical activity, in improving health and reducing the risk of disease (z=-2.8, p<0.01). Twenty six per cent of carers said there were no relevant barriers to the participant changing to a healthier diet, and 23% believed that there were no relevant barriers to the participant with intellectual disabilities increasing their level of physical activity.

**Conclusions:** Paid carers have significant training needs relevant to weight loss interventions. Training initiatives for paid carers should be considered a key part of effective weight loss interventions for adults with intellectual disabilities.

**Funding:** This study was funded by the Research and Development Directorate of NHS Greater Glasgow and Clyde

## T4:PS:54

**The Assessment of Obesity and Hyperlipidemia in diabetic patients of Taleghani General Hospital, 2006**Derakhshani, K<sup>1</sup>, Mohammadian, P<sup>2</sup>.<sup>1</sup>Taleqani Hospital, Shaheed Beheshti University of Medical Sciences, Tehran, Iran.<sup>1,2</sup> Taleghani General Hospital, Tehran, Iran

**Introduction:** This study was conducted to assess the relationship between obesity and hyperlipidemia in diabetic patients of Taleghani general hospital.

**Material & Methods:** Sixty-five bedridden diabetic patients aged 16 to 80 years were chosen by random sampling from endocrinology ward of the hospital, in 3 months. Demographic data covering age, diabetic duration, smoking habit, height and weight collected for each patient and BMI calculated by  $W \text{ (kg)} / H^2 \text{ (m}^2\text{)}$ . Serum Cholesterol and Triglyceride was measured using commercial kit. Statistical analysis was carried out using SPSS.

**Results:** The mean diabetic duration was 7.97 years. 57% of diabetic patients had positive familial history. The mean BMI was 26.028. Out of the total number of patients included in this study, 16 patients (8.07%) were over weight and obese to some extent and 15 patients (32.33%) were severely obese. And also, the results showed that obese patients were more susceptible to both hypercholesterolemia and hypertriglyceridemia than patients with normal BMI.

**Conclusion:** Diabetic patients have several major risk factors, especially obesity and hyperlipidemia. In order to reduce risk factors, it is highly recommended to provide diabetic patients with correct information about healthy eating and nutritional education, as high risk population of the community.

**Track 5: Prevention and Public Health****Track 5 ISC Abstract Selected Posters**

## T5:PS.01

**Environmental influences on truck drivers' obesity risks in North America**Y. Apostolopoulos<sup>1,2</sup>, PhD, S. Sonmez<sup>3</sup>, PhD, J. Kronenfeld<sup>4</sup>, PhD

<sup>1</sup>Natural Science & Public Health, Zayed University, Abu Dhabi Campus, UAE, <sup>2</sup>Emory University School of Medicine, Atlanta, Georgia, USA, <sup>3</sup>Communication & Media Sciences, Zayed University, Dubai Campus, UAE, <sup>4</sup>Social and Family Dynamics, Arizona State University, Tempe, Arizona, USA

**Background:** The trucking sector significantly impedes truck drivers' opportunities for physical activity and prudent dietary patterns, thus substantially elevating their obesity risks. This paper examines how the "transportation environment" (government regulations, trucking operations, corporate policies in trucking settings, and the built environment) in North America triggers, exacerbates and sustains truckers' risks for obesity and associated comorbidities.

**Methods:** By utilizing the MEDLINE and TRANSPORT databases, an exhaustive review of health and social science literature was conducted on truckers' obesity risks, and 120 journal articles and reports were identified for closer analysis. From these, populations, exposures, and relevant outcomes were evaluated within the framework of the transportation environment.

**Results:** Strong links between the transportation environment and truckers' risks for obesity and associated comorbidities were delineated, and a conceptual framework was developed to illustrate potential causal links between the two. While this framework does not constitute the basis for an integrated theory on the role of environmental factors in obesity risks of professional drivers, it does offer a logical step toward the eventual formulation of such a theory by permitting the operationalization of diverse constructs that can be empirically tested. Moreover, it provides direction for preliminary environmental-scale interventions to curb trucker obesity.

**Conclusions:** This framework underscores the need for further empirical research to: (a) appraise the health parameters of trucking settings; (b) assess truckers' obesity risk trajectories; (c) examine potential causality between the transportation environment, inactivity and poor diets and related comorbidities; and (d) develop, implement, and evaluate interventions to mitigate trucker obesity.

## T4:PS:55

**The quality of successful weight management: Predictors and correlates of long-term success in juveniles and young adults**Guggenberger, C.,<sup>1,2</sup> Siegfried, W.,<sup>2</sup> & Ardel-Gattinger, E.<sup>1</sup><sup>1</sup> Department of Psychology, Paris-Lodron-University Salzburg, Austria;<sup>2</sup> Obesity Centre Insula, Bischofswiesen / Strub, Germany

**Introduction:** Obesity treatment is successful in respect to short or middle-term effects but long-term success is not satisfying. A combination of diverse salutogene and pathogen factors influencing eating and exercise style is important in respect to obesity development, progress and management. One purpose of the study was to identify salutogene factors that are meaningful for successful long-term weight management.

**Methods and Material:** A group comparison design was used to examine differences in quality and quantity of the adopted salutogene strategies and the assumed hierarchical influence of the single factors constituting successful long-term weight management. A broad battery of questionnaires was necessary to measure salutogene and pathogen factors. The psychological test battery consists of the interdisciplinary test system for obesity diagnosis and evaluation "Ad-Eva" (Ardel-Gattinger & Meindl, in press).

**Results:** The results show that in almost all relevant dimensions the successful weight management group showed more significant and stable health promoting behaviour patterns. The successful weight loss maintainers show more flexible control in their eating patterns, report higher levels of physical activity and active leisure time behaviour, have better implementation strategies of their knowledge about health promoting behaviour, are lower in eating disinhibition and restraint, craving, binge eating and subclinical eating psychopathology.

**Conclusions and Discussion:** The significant and substantial differences in psychological dimensions should be implemented in a hierarchical structure of criterions that constitute health promoting behaviour in obese subjects so that multi-trait and multi-method analysis of the existing data has to follow to clear the promising results of the presented study.

## T5:PS.03

**Associations among obesity, blood pressure, and left ventricular mass**A.B.R. Maggio M.D<sup>1</sup>, Y. Aggoun, M.D<sup>1</sup>, L.M. Marchand<sup>1</sup>, X.E. Martin<sup>1</sup>, F. Herrmann, M.D<sup>2</sup>, M. Beghetti, P.D<sup>1</sup>, N.J. Farpour-Lambert, M.D<sup>1</sup>

<sup>1</sup> Pediatric Cardiology Unit, Department of Child and Adolescent, <sup>2</sup> Department of Rehabilitation and Geriatrics, University Hospitals of Geneva, Switzerland

**Objectives:** To measure resting and ambulatory systemic blood pressure (BP) and left ventricular mass (LVM) in pre-pubertal obese and lean children, and to determine their relationships.

**Study design:** Cross-sectional study including 44 obese and 22 lean pre-pubertal children (mean age 8.8±1.5 years). We measured: casual and 24-hour ambulatory BP; LVM and LVM index (LVMI) by echocardiography; whole body lean tissue and fat mass by DEXA.

**Results:** Mean 24-hour systolic BP (124.8±14.2 vs. 105.5±8.8 mmHg), diastolic BP (72.8±7.3 vs. 62.7±3.8 mmHg) and LVMI (36.1±5.8 vs. 30.9±5.7, g·m<sup>-2.7</sup>) were significantly higher in obese than in lean subjects. Systolic ambulatory hypertension was present in 47.6% of obese children, casual BP missing the diagnosis in 55% of cases. Body fatness, lean tissue mass and 24-hour BP correlated positively with LVMI. When adjusted for body fatness, LVMI was associated with 24-hour systolic BP only (adjusted R<sup>2</sup>=15.9%; p=0.001).

**Conclusions:** Ambulatory systemic hypertension and increased LVM appear before puberty in obese children. Left ventricular mass is partially determined by systemic BP; however increased LVM may occur before the development of hypertension. We conclude that prevention and treatment of childhood obesity should be initiated as early as possible to prevent the premature development of hypertension and end-organ damage.

**Funding:** Research relating to this abstract was funded by the Swiss National Science Foundation and the Geneva University Hospitals Research and Development Fund.

## T5:PS.04

**Effects of current and adult body weight, weight changes, and comorbidities on the rate of disability in an elderly population.**

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<sup>1</sup>Clinica Medica 1, Dipartimento di Scienze Mediche e Chirurgiche, University of Padova, Italy

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<sup>3</sup>Aging Section, Consiglio Nazionale delle Ricerche (CNR) Institute of Neurosciences, Padova, Italy

<sup>4</sup>Azienda Unità Locale Socio Sanitaria (ULSS)16, Padova, Italy

<sup>5</sup>Azienda Ospedaliera, Padova, Italy

**Introduction:** The role of weight changes after adulthood on the prevalence of late disability is little understood. We analyzed the effects of weight loss and weight gain after adulthood on the prevalence of late disability, with comorbidities taken into account as potential confounders.

**Methods:** 2908 (1188 M; 1720 F) Italians aged  $\geq 65$  from the ProVA study was analyzed. ProVA was a population study with a comprehensive clinical evaluation on the most important chronic diseases and functional limitations. Disability status, defined as impairment in at least one ADL, was analyzed according to current BMI, BMI at 50 years of age, and intercurrent weight changes ( $+>10\%$  of 50 y.o. body weight;  $+>5\%$ ; stable weight;  $->5\%$ ;  $->10\%$ ).

**Results:** Obesity at 50 was a risk factor for development of disability in the elderly (OR: 2.05; %CI: 1.56-2.71). Obesity at the baseline (OR: 1.79; %CI:1.38-2.32) was also associated with disability as compared to normal weight subjects. Both weight loss  $>10\%$  (OR: 1.57; %CI:1.15-2.14) and weight gain  $>10\%$  (OR: 1.49; %CI:1.12-1.96) were associated with presence of disability as compared to stable weight. Adjustment for major chronic diseases (cardiovascular diseases, diabetes, COPD, neurologic degenerative diseases, osteoarthritis, neoplastic diseases) and smoking status increased the relationship between weight gain and disability, but suppressed the association with weight loss.

**Conclusion:** Weight loss after adulthood was associated to disability status, but this association was suppressed if chronic diseases were taken into account. On the contrary, weight gain after adulthood was associated to an increased risk of disability irrespective of comorbidities.

**Funding:** The ProVA study was funded by a grant from Fondazione Cassa di Risparmio di Padova e Rovigo.

## T5:PS.06

**Persuasive food marketing to children: cartoons and competitions on sydney commercial television**

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<sup>1</sup>NSW Centre for Overweight and Obesity, University of Sydney, Sydney, Australia

<sup>2</sup>NSW Centre for Public Health Nutrition, University of Sydney, Sydney, Australia

Australian children have high levels of exposure to television advertising of high fat, high sugar foods, which are broadcast more frequently during programs popular with children. By contrast, there has been little published research on the use of persuasive marketing techniques in food advertising in Australia or internationally, despite evidence that food marketing influences children's food preferences.

This study aimed to investigate children's exposure to persuasive marketing techniques in food advertising on Sydney commercial television.

Advertisements broadcast on all 3 commercial Sydney television channels were recorded for the equivalent one week period in 2006 and 2007. Food advertisements that used persuasive marketing, including premium offers (competitions, toys, rebates and vouchers) and promotional characters (celebrities and cartoon characters) were identified, with type of persuasive technique and food type coded by members of the research team, and checked for reliability. Commercial data on children's viewing patterns were used to determine peak viewing times.

Of the 20,201 advertisements recorded over 14 days, 25.5% were for food. During children's peak viewing times, 61% of food advertisements were for high fat/high sugar foods. More food advertisements contained promotional characters ( $P<0.05$ ) and premium offers ( $P<0.001$ ) during children's peak viewing times compared to non-peak times. There were 18 times more food advertisements using premium offers during programs popular with 5-12 year olds than during adults' popular programs ( $\chi^2 = 19.76$ ,  $P<0.0001$ ).

Persuasive marketing of high fat/high sugar foods is targeted specifically to children and must be considered as part of the debate on advertising regulations.

**Funding:** The NSW Centre for Overweight and Obesity received funds from the NSW Department of Health for this work.

## T5:PS.05

**Associations of birth weight and growth during infancy with body composition at age 15 - the COMPASS study**

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<sup>1</sup>Department of Public Health Sciences, Karolinska Institutet, Stockholm, Sweden

<sup>2</sup>Division of Epidemiology, Stockholm Centre for Public Health, Sweden

**Introduction:** Associations between postnatal growth and body composition later in life have rarely been studied. The purpose of this study was to explore the associations between birth weight, weight gain during first year of life and body composition in adolescence.

**Methods:** Birth characteristics and weight during childhood were collected from registers and child health centre records in this population-based study of 2,453 adolescents. Body composition at age 15 was measured by bioelectric impedance analysis. Linear regression models were adjusted for current age, birth length z-score, maternal and socioeconomic factors.

**Results:** Estimates of changes in body composition per 1 SD increase in sex- and gestational age-specific birth weight, and per unit increase in weight z-score during the first year of life are presented in the table; mean (95% CI). The effect of increased weight gain in infancy was not modified by birth weight.

	Boys n=1,255		Girls n=1,198	
	Birth weight	Postnatal growth <sup>1</sup>	Birth weight	Postnatal growth <sup>1</sup>
BMI (kg/m <sup>2</sup> )	0.73 [0.47;0.98]	1.11 [0.87;1.35]	0.32 [0.06;0.58]	1.32 [1.06;1.58]
FFMI (kg/m <sup>2</sup> )	0.49 [0.34;0.63]	0.73 [0.60;0.87]	0.25 [0.12;0.38]	0.63 [0.50;0.76]
FMI (kg/m <sup>2</sup> )	0.24 [0.08;0.39]	0.38 [0.22;0.53]	0.07 [-0.09;0.23]	0.70 [0.53;0.86]
FM (%)	0.42 [-0.10;0.93]	0.80 [0.29;1.30]	-0.12 [-0.55;0.31]	1.51 [1.07;1.95]
WC (cm)	1.32 [0.67;1.96]	1.82 [1.20;2.44]	0.82 [0.23;1.40]	2.61 [2.02;3.19]

<sup>1</sup>Additionally adjusted for length at 1 y z-score

**Conclusion:** Birth weight and postnatal growth were both positively associated with body composition in adolescence. Increased weight gain during first year of life had stronger effect than birth weight, suggesting infancy to be a more critical period.

## T5:PS.07

**Maternal obesity and congenital anomalies: a systematic review**

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Institute of Health and Society, Newcastle University, Newcastle upon Tyne, UK

**Background and Aim:** Accumulating evidence suggests an association between maternal obesity and the risk of some congenital anomalies, particularly neural tube defects (NTDs). This systematic review and meta-analysis is the first to assess current available evidence relating to the association between maternal obesity and the risk of congenital anomaly.

**Method:** The electronic databases Medline, Embase and Scopus were searched using a comprehensive keyword list for articles published from January 1966 to September 2007. Studies were included if they were English language observational studies reporting data on weight in pregnancy and an outcome measure of congenital anomalies. Pooled odds ratios comparing the risk among obese and non-obese mothers (defined by BMI) were determined for all congenital anomalies (NTDs, cardiovascular, renal and alimentary tract anomalies) and congenital anomaly groups with  $>150$  cases across all the studies.

**Results:** We found 1737 potential articles, of which 38 met the inclusion criteria. Five were excluded because of over-lapping data, one due to fewer than 150 cases for the congenital anomaly and two because type of congenital anomaly was not specified, leaving 23 studies in the meta-analysis. Pooled odds ratios comparing the risk among obese mothers to non-obese mothers identified statistically significant increased risks for NTDs [1.84 (95% CI: 1.62, 2.09)] and all cardiovascular defects [1.22 (95% CI: 1.15, 1.30)], as well as for several individual anomaly subtypes.

**Conclusions:** This systematic review and meta-analysis found an almost two-fold increased risk for NTDs and a smaller but significant risk for cardiovascular anomalies. This has implications for prevention and screening.

**Funding:** KS was supported by the charity BDF Newlife

## T5:PS.08

**The relative importance of BMI and physical activity on cardiovascular disease risk factors**Al-Haifi A<sup>1</sup>, Elia M<sup>1</sup>, Wootton S<sup>1</sup>, Jackson J<sup>1</sup>.<sup>1</sup>University of Southampton, Southampton, United Kingdom

**Introduction:** There is no clear consensus whether body mass index (BMI) or physical activity (PA) is more important in cardiovascular disease (CVD) prevention. Only a limited number of studies have compared the relative effects of BMI and PA on the health risk factors for CVD. Therefore, the aim of this study was to compare the relative importance of BMI and PA on the levels of systolic blood pressure (SBP), total cholesterol (TC) and high-density lipoprotein (HDL).

**Methods:** This was a secondary data-set analysis of 1658 adults (aged 19-64 years) obtained from the 2004 UK National Diet and Nutrition Survey (NDNS). PA was a categorized metabolic-equivalent (MET) value extracted from the NDNS self-reported seven-day diary. A General Linear Model was used to calculate the partial-eta-squared percent (proportion of variability) with adjustment for age and smoking, and individuals taking medications were excluded.

**Results:** In women, the partial-eta-squared percent of BMI vs PA for SBP, TC and HDL were 11.4% ( $P<0.001$ ) vs 1.4% ( $P=0.195$ ), 6.6% ( $P<0.001$ ) vs 0.5% ( $P=0.759$ ), and 8.2% ( $P<0.001$ ) vs 0.5% ( $P=0.719$ ), respectively. In men, the partial-eta-squared percent explained by BMI vs PA for SBP, TC and HDL were 6.4% ( $P<0.001$ ) vs 1.0% ( $P=0.289$ ), 1.0% ( $P=0.511$ ) vs 4.0% ( $P=0.009$ ), and 7.1% ( $P<0.001$ ) vs 6.3% ( $P<0.001$ ), respectively.

**Conclusion:** The evidence from this data set suggests that BMI explains a greater proportion of the variation in the health risk factors than does PA, particularly in women.

This study is funded by the Embassy of the State of Kuwait

## T5:PS.10

**Parental feeding styles and child eating behaviors correlate with dietary intake and BMI of 2-year old children of overweight mothers.**Fuemmeler, BF<sup>1</sup>, Pendzich, MK<sup>1</sup>, Moriarty, L<sup>1</sup>, Street, EE<sup>2</sup>, Lovelady, C<sup>2</sup>, Østbye, T<sup>1</sup>,<sup>1</sup>Community and Family Medicine, Duke University, Durham, N USA, <sup>2</sup>Nutrition, University of North Carolina at Greensboro, Greensboro, NC USA

**Introduction:** This study examines associations among 2-year old children's BMI, diet, eating behaviors and parental feeding styles in a racially diverse group of mothers who were overweight prior to pregnancy.

**Methods:** Mothers ( $n = 176$ ) participating in a 2-year postpartum obesity prevention trial brought their 2-year old in for their final follow-up visit. Children's height and weight were measured and mothers completed a survey including the Children's Eating Behaviour Questionnaire (CEBQ) (Wardle, 2001) and the Parental Feeding Style Questionnaire (PFSQ) (Wardle, 2002). Mothers reported their child's dietary intake on two separate days and data were analyzed using Nutrition Data Systems (NDS) software.

**Results:** Average energy intake (Kcal) was associated with child eating behaviors with both whites and African-Americans, specifically Food Responsiveness ( $r=0.242$ ,  $p=0.001$ ), Emotional Over-eating ( $r=0.153$ ,  $p=0.047$ ), Desire to Drink ( $r=0.180$ ,  $p=0.017$ ), and Satiety Responsiveness ( $r=-0.189$ ,  $p=0.014$ ). When stratified by race, Food Responsiveness ( $r=0.288$ ,  $p=0.011$ ) was significant only for African Americans. Similar correlations between energy intake and PFSQ revealed significant findings for Instrumental Feeding for whites ( $r=0.211$ ,  $p=0.043$ ) and all races ( $r=0.190$ ,  $p=0.012$ ). Control was significant only for African Americans ( $r=-0.281$ ,  $p=0.014$ ). Correlations between child BMI z-score (zBMI) and CEBQ were significant for Enjoyment of Food for whites only ( $r=0.189$ ,  $p=0.039$ ). On the PFSQ, Emotional Feeding was correlated with zBMI for whites only ( $r=-0.185$ ,  $p=0.042$ ).

**Discussion:** The findings confirm what is found in the literature and extend them by demonstrating variability by racial background. There is an association between obesity phenotypes and children's eating behaviors and parental feeding style.

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## T5:PS.09

**Prevalence of Child Obesity in French Polynesia: a 3555 children study**Folope, V.<sup>1,2</sup>, Tetuakaua, T.<sup>3</sup>, Parrat, E.<sup>3</sup>, Grigioni, S.<sup>1</sup>, Rachedi, F.<sup>2</sup>, Déchelotte, P.<sup>1</sup><sup>1</sup>Nutrition Unit and ADEN EA3234; IFR23-University Hospital of Rouen, France, <sup>2</sup>Dept. of Endocrinology; Hospital Centre of French Polynesia, Tahiti, <sup>3</sup>Dept. of Pneumology; Hospital Centre of French Polynesia, Tahiti.

**Background:** The prevalence of adult obesity has sharply increased in French Polynesia in recent years, reaching nearly 40% of the population. Up to now, there isn't data available in children.

**Objective:** To establish the prevalence of childhood overweight and obesity in a representative sample of main islands of French Polynesia (Tahiti, Moorea, Rangiroa, Nuku Hiva and Tubuai).

**Methods:** Heights and weights were measured by nurses in a prospective study during the second semester of 2006, in the schools of different islands. At the endpoint, 3555 children were analysed using the International Obesity Task Force (IOTF) cut-offs.

**Results:** The mean age of children was  $12.6 \pm 0.96$  years with 49.7% of boys and 50.3% of girls. Overweight (BMI superior of 97<sup>th</sup> percentile for age and sex) was present in 31.6% of school-age children, with no significant difference between boys (32.9%) and girls (30.4%) ( $p=0.21$ ). There was a significant difference between the islands with an overweight prevalence of 16.9% [9.3-27.1] in Rangiroa and of 39% [32.4-46.0] in Tubuai. Obesity with IOTF criteria was present in 12% of children, particularly in boys (13.2%) while it was 10.8% in girls ( $p=0.001$ ). There was no significant difference between the islands in terms of obesity.

**Conclusion:** Our data suggest that in French Polynesia levels of childhood obesity is among the highest recorded in the world, near those found in the United States. The alarming rate of prevalence of obesity in school children of French Polynesia reinforces the need for monitoring and implementation of nutritional interventions.

## T5:PS.11

**Validation of a reduced bmi cut-off for estimating obesity prevalence based on self-reported height and weight**Kossovsky, MP<sup>1</sup>, Dauphinot, V<sup>2</sup>, Naudin, F<sup>2</sup>, Wolff, H<sup>1</sup>, Gaspoz, JM<sup>1</sup><sup>1</sup>Geneva University Hospitals, Geneva, Switzerland, <sup>2</sup>CETAF, Saint Etienne, France

A cross sectional study conducted in France in 2002-03 comparing self-reported with measured data showed that obesity prevalence determined by body mass index (BMI) calculated from self-reported weight and height was underestimated: 30.1% of men and 34.3% of women not considered obese according to their self-reports were classified as such by measurements. We proposed to lower the self-reported BMI threshold defining obesity to 29.0 for men and 28.4 for women. This yielded to an estimation of obesity prevalence similar to the one obtained using measurements (15.1% vs. 14.4%,  $p=0.21$ ) and was the best compromise between sensitivity (83.5%) and specificity (96.4%).

A validation procedure was performed on a different population. From 1993 to 2004, a sample of 13,266 men and women (500 each per year) was recruited in Geneva, Switzerland. Self-reported and measured BMI were routinely collected. The reduced threshold for obesity based on self-reported data was applied and its performance compared to measured data. The reduced obesity threshold could correctly classify subjects in 95.5% of cases, with a sensitivity of 88.9% and specificity of 96.5%. Positive and negative predictive values were respectively 78.6% and 98.4%.

Subjects in population studies tend to underestimate their weight and to overestimate their height. This yields to erroneous obesity prevalence in populations where this estimation is based on self-reports only. Contrasting with corrective equations, this readily applicable reduced threshold does not require collection of additional data. Its applicability to other European or American countries requires further validation.

**Conflict of interest:** None disclosed

**Funding:** Research relating to this abstract was funded by Swiss and French public organizations

## T5:PS.12

**Physical activity reduces the influence of genetic effects on BMI and waist circumference – a study in young adult twins**

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**Background:** The role of genetic factors in the relationship between physical activity and obesity has been rarely studied, although family studies show that both BMI and exercise behavior are genetically influenced. We analyzed the inherited and acquired relationships between obesity measures and physical activity (PA) and whether physical activity modifies the amount of genetic influence on BMI and waist circumference (WC).

**Methods:** The FinnTwin16 Study is a population-based, longitudinal study of five consecutive birth cohorts (1975-1979) of twins. Data on height, weight, WC and PA of 4343 subjects at the average age of 25 (range 22-27) years were obtained by questionnaire. Quantitative genetic analyses based on linear structural equations were carried out by the Mx statistical package. The modifying effect of physical activity on genetic and environmental influences was analyzed using gene-environment interaction models.

**Results:** The heritability estimates were 75% in males and 77% in females for BMI, 67% and 69% for WC and 45% and 52% for PA, respectively. There was an inverse relationship between PA and WC in males and females and between PA and BMI in females only. Physical activity significantly modified the heritability of BMI and WC, so that a high level of physical activity decreased the additive genetic component in BMI and WC.

**Conclusions:** Physically active subjects were leaner than sedentary ones and physical activity reduced the influence of genetic susceptibility on BMI and WC. This indicates that the individuals at greatest genetic risk of developing obesity would benefit the most from physical activity.

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## T5:PS.14

**Tonsillectomy and the development of overweight: the PIAMA birth cohort study**

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Accelerated weight gain after (adeno)tonsillectomy has been reported in children. Underweight used to be common in children undergoing (adeno)tonsillectomy and, in the past, increased weight gain was invariably described as a beneficial effect. Nowadays, underweight is not as common as it used to be in the patient population and recent studies showed that weight substantially increased after (adeno)tonsillectomy, not only in underweight children, but also in normal weight and overweight children.

We investigated the association between (adeno)tonsillectomy and overweight in 3,963 children, participating in the Dutch PIAMA birth cohort.

Children were recruited from the general population. Weight and height were measured by the investigators at the age of 8 years. Data on adenoidectomy and tonsillectomy and on confounders (gender, birth weight, maternal education, maternal overweight, maternal smoking during pregnancy, breast feeding and smoking in the home) were obtained from annual questionnaires completed by the parents.

The cumulative incidence up to age 8 was 11% for adenoidectomy (without tonsillectomy) and 14% for (adeno)tonsillectomy. Logistic regression analysis showed that (adeno)tonsillectomy was significantly associated with overweight (including obesity) at age 8 (adjusted OR: 1.87; 95%CI: 1.31-2.65). Adenoidectomy (without tonsillectomy) was also associated with increased risk of overweight, but the association was not statistically significant. Overweight at the age of 2 was not associated with increased risk of (adeno)tonsillectomy in later years (adjusted OR: 1.03; 95%CI: 0.58-1.82), indicating that the association between (adeno)tonsillectomy and overweight was not explained by reverse causation.

**Funding:** This work was supported by the Netherlands Organisation for Health Research and Development, the Netherlands Asthma Foundation and the Netherlands Ministry of Health, Welfare and Sport.

## T5:PS.13

**Genetic variations in regulatory pathways of fatty acid and glucose metabolism are associated with obesity-phenotypes: a population based cohort study**

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**Background:** Obesity frequently clusters with aberrant blood lipid levels and insulin resistance. As nuclear receptors and transcription factors play an important regulatory role in fatty acid and glucose homeostasis, genetic variation in these key regulators and downstream pathways may be involved in the onset of obesity.

**Objective:** To explore associations between single nucleotide polymorphisms (SNPs) in candidate genes from regulatory pathways that control fatty acid and glucose metabolism, and repeated measurements of body mass index (BMI) and waist circumference in a large Dutch study population.

**Methods:** A total of 384 SNPs across 253 genes were genotyped among 3575 participants of the Doetinchem cohort, who were examined three times during 11 years, using the Illumina Golden Gate assay. Adjusted random coefficient models were used, whereas false discovery rate *q*-values were calculated to account for multiple testing. Significance of the associations was defined as a *q*-value below 0.20.

**Results:** Two SNPs in *FXR* and *SMARCA2* (in women only) were significantly associated with both BMI and waist circumference. In addition, two SNPs in *SIRT1* and *SCAP* (in women only) were associated with BMI alone. Another SNP, in *IL6*, was associated with waist. None of these associations has been reported before. Another 23 associations between SNPs and either BMI or waist had *p*-values less than 0.05, but *q*-values above 0.20.

**Conclusion:** In our explorative study among a relatively large population-based sample we detected five novel SNPs associated with obesity-phenotypes. Replication of these findings and further research on the functionality of these SNPs is necessary.

**Funding:** Research relating to this abstract was funded by the National Institute for Public Health and the Environment (Internal funding for strategic research; project number S/350600).

## T5:PS.15

**Risky business – is physical activity losing the hard news race?**

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**Background:** The media are a key element of the obesogenic environment. Analysis of television news coverage of obesity shows physical activity (PA) is represented as less important to obesity than nutrition.

**Aims:** To analyse news coverage of PA to determine what aspects of PA attract media attention and how news frames the risks and benefits of PA.

**Method:** A search of a database of television news and current affairs health items broadcast in NSW, Australia (May to October 2005), identified 91 items with a PA element. A content and frame coding sheet was used to code for item length, genre, news angle, risks and benefits of PA, risks of inactivity.

**Results:** We identified 91 items about PA/fitness. Stories about weight-loss accounted for 17% of the television items. Fifteen per cent were about quirky aspects of physical activity/obesity/health, 12% were about modern medical miracles and 8% were about the risks of exercise. PA was most often presented in magazine style programs (40% of items). Less than one third (30%) of the items were found in news programs and 27% were current affairs items. Risks of PA were mentioned 57 times, more often than the risks of inactivity (40 mentions). Benefits of PA were mentioned 265 times.

**Discussion:** Physical activity gains much of its news values from news media interest in obesity. Media coverage reinforces beliefs that PA is beneficial, however the risks of inactivity are under-reported and the risks of PA are over-emphasised given their relative contributions to disease and death.

**Funding:** Research relating to this abstract was funded by the New South Wales Health Department

## T5:PS.17

**10-year changes of parameters of nutritional status in 6-year old children of the Kiel Obesity Prevention Study (KOPS): 1997 vs. 2007**

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**Aim:** Today increasing rates of childhood obesity is a global public health concern. This study investigates whether parameters of nutritional status have changed during the last decade.

**Methods:** 2 cross-sectional surveys as part of KOPS: 1. examination 1997: 393 boys, 422 girls, age: 6.3 (6.0-6.5) years; 2. examination 2007: 580 boys, 591 girls, age: 6.1 (5.9-6.4) years. We assessed: height, weight (definition of overweight:  $\geq 90^{\text{th}}$  age- and sex-specific German reference percentiles (Kromeyer-Hauschild et al., 2001)), waist circumference, triceps skinfold thickness (TSF) and upper arm muscle area (UAMA) (Rolland-Cachera et al., 1997). Self-estimated parental height and weight (obesity:  $\text{BMI} \geq 30 \text{ kg/m}^2$ ). Anthropometric data were adjusted for age. Statistics: Mann-Whitney-U-test and  $\text{Chi}^2$ -test.

**Results:** In children the prevalence of overweight did not change within the last 10 years (boys: 10.7% vs. 10.9%; girls: 14.7% vs. 13.6%). However, waist circumference (boys: +0.8cm,  $p < 0.05$ ; girls: +0.7cm,  $p < 0.05$ ) as well as TSF increased (boys: +0.7mm,  $p < 0.001$ ; girls: +1.7mm,  $p < 0.001$ ) whereas UAMA decreased (boys: -1.7cm<sup>2</sup>,  $p < 0.001$ ; girls: -2.0cm<sup>2</sup>,  $p < 0.001$ ). The prevalence of parental obesity increased (fathers: 7.4% vs. 12.0%,  $p < 0.05$ ; mothers: 8.7 vs. 13.2%,  $p < 0.05$ ).

**Conclusion:** The prevalence of overweight did not change in children. By contrast, the prevalence of parental obesity increased. This trend was also seen in some parameters of nutritional status in the children.

**Funding:** DFG-MU714-5.1-5, WCRF, Wirtschaftliche Vereinigung Zucker, BMBF

## T5:PS.19

**Body satisfaction and transformation of social norms for body size of Tunisian men and women- findings from the TAHINA project**Holdsworth, M<sup>1</sup>, Mahjoub, A<sup>2</sup>, Eymard-Duvernay, S<sup>3</sup>, Ben-Alaya D<sup>2</sup>, Lefèvre P<sup>4</sup>

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**Background:** This study aimed at determining body size satisfaction to investigate whether perception of social norms for body size varies in different groups of society, to see if there is a differences of attitudes between men and women, younger adults, those of higher economic status, those living in urban versus rural areas, married versus single adults, and obese, overweight and normal weight adults. As Tunisia is in an advanced stage of epidemiological transition, the aim was to see if attitudes also appear to be in transition.

**Method:** A cross-sectional survey was conducted with a nationally representative random stratified, 2-level clustered sample of households aged 35-70 yrs in 2005. An attitudinal scale was developed and validated for this study and contained 13 items that assessed 3 domains- Body satisfaction; Fatness as a value; and Slimness as a value (internal consistency 0.62-0.70 using cronbach's alpha). Linear regression models were used to assess raw and adjusted effect of socio demographic factors on each score.

**Results:** 5416 households participated, of which 63% were either overweight or obese ( $\text{BMI} \geq 25$ ). Half of women and one-third of men were dissatisfied with their current weight. Those living in cities, on higher income, or with higher education levels were the least satisfied with their body weight ( $p < 0.0001$ ). These same groups had a preference for slimmer, whereas fatness was valued more in rural areas, by illiterate, low income adults ( $p < 0.0001$ ). There was no preference by younger adults for slimmer body sizes, as had been expected.

**Conclusion:** The finding that norms for body size in urban areas and in wealthier, higher educated groups are for slimmer suggests a transition to those resembling many western cultures.

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## T5:PS.18

**Historical trends in overweight, obesity and adiposity: International comparisons of direct measures from Canada and the United States, 1959-2005.**Hawes, RA<sup>1,2</sup>, Tremblay, MS<sup>2</sup>, Connor-Gorber, S<sup>1,2</sup>, McDowell, I<sup>3</sup>

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In North America, the dramatic rise in overweight and obesity threatens to overwhelm health and social systems via increases in chronic disease, morbidity and premature mortality, coupled with losses in economic productivity (WHO, 1998; Birmingham et al., 1999). Whereas the majority of obesity surveillance in Canada has relied on self-reported data (McDonald et al., 1997), exact comparisons with direct measures from the United States (Flegal et al., 2000) have been less tenable. To facilitate these international comparisons and to provide an empirical assessment of historical trends in obesity, direct measures of adiposity were compared using 14 surveys from the United States National Health and Nutrition Examination Surveys (1959-2004) and a suite of Canadian surveys located at Statistics Canada (1972-2005). Multiple logistic regression was used to estimate the simultaneous contributions of age and gender in the temporal association with overweight, obesity and skinfold measures. We estimate an increase of 18.4% and 15.7% in overweight ( $\text{BMI} > 25$ ) and an increase of 13.2% and 15.1% in obesity ( $\text{BMI} > 30$ ) for Canada and the United States, respectively. Significant differences in the age-and gender-specific comparisons of overweight and obesity between the two nations are presented, and the associated changes in risk trajectories are identified. The utility of collecting directly measured anthropometric data is discussed, along with the implications of the obesity epidemic for health and social policy in Canada and the United States.

## T5:PS.20

**Multiple factors for development of overweight and obesity in preschool children in urban areas of Ho Chi Minh City, Vietnam**Huynh, D<sup>1</sup>, Dibley, M<sup>2</sup>, Sibbritt, D<sup>3</sup>, Tran, H<sup>1</sup>, Ploeg, H<sup>4</sup>

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<sup>4</sup> Centre for Clinical Epidemiology and Biostatistics, Faculty of Health, University of Newcastle, Australia.

**Aims:** To identify risk factors for the development of overweight and obesity in a cohort of preschool children.

**Methods:** A one year follow-up study, with three measurements was conducted at 6 month intervals from 2005 to 2006 on 526 children aged 4 to 5 years in preschools in Ho Chi Minh City, Vietnam. Information on neighbourhood, preschool and home environments, socio-economic status, the child and parental characteristics were collected using interview-administered questionnaires. Dietary intake and physical activity were measured using modified, validated questionnaires. Weight, height were measured and body mass index ( $\text{BMI: kg/m}^2$ ) was calculated. Overweight/obesity was classified using IOTF criteria. Generalized estimating equations (GEEs) were employed to assess longitudinal relationships between risk factors and development of overweight/obesity.

**Results:** Similar factors predicting development of overweight/obesity and obesity only were wealthiest family and male gender. Other factors including emotional relationship with parents (adjusted relative risk, 1.47, 95% CI, 1.01 to 2.15), availability of fruit and vegetables at home (0.50, 0.33 to 0.76), paternal overweight (1.44, 1.05 to 1.98), TV viewing in hours (1.08, 1.00 to 1.16) and vigorous activity in hours (0.94, 0.87 to 1.00) were associated with overweight/obesity. Neighborhood safety (0.66, 0.46 to 0.94), both parents overweight (2.16, 1.41 to 3.32), breast-feeding (0.97, 0.95 to 0.99), and sleep hours at night (0.75, 0.61 to 0.92) were significantly related to obesity.

**Conclusion:** The aetiology of the development of overweight and obesity in this child population is multi-factorial. An effective prevention program should be multifaceted.

**Funding:** Research relating to this abstract was funded by the Wellcome Trust

## T5:PS.21

**The “Thin-Fat” Indian Child: Is His Insulin Resistance Related To Body Composition?**

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**Introduction:** South Asians are substantially more adipose (% fat) than white Caucasians, and are more insulin resistant. It is not known to what extent the two are linked.

**Aim:** To establish the relationships of body composition to insulin resistance (IR) within and between age-matched populations of rural Indian and urban Caucasian children.

**Methods:** 158 boys and 122 girls (mean age 6.9±0.2y) from the EarlyBird Diabetes Study (EBDS) in Plymouth UK, were compared with 363 boys and 324 girls (mean age 6.2±0.5y) from the Pune Maternal Nutrition Study (PMNS) in rural India. Anthropometry (height, weight, BMI), body composition (fat and lean mass by DEXA) and insulin resistance (HOMA-IR) were measured using standardized methods.

**Results:** The EBDS children were heavier (B +6.1, G +6.3 kg; p< 0.001) and taller (B +11.7, G +7.1 cm; p< 0.001), but the PMNS were fatter after adjustment for age/height/weight (B +9.4, G +12.4%, p<0.05) and more insulin resistant (B+182%, G+247%, p<0.001) Body fat% explained only 2% (B) and 8% (G) of the variance in IR among PMNS children and 1% (B) and 18% (G) among EBDS children. However, the greater adiposity of PMNS children explained 33% (B) and 34% (G) of the difference in IR between populations. Lean mass was not an independent determinant of IR.

**Conclusion:** Adiposity explains little of the variance in IR within the populations, but a sizeable proportion of the difference between them. The additional fat of Indian children may have a particular influence on IR.

**Funding:** The EarlyBird Study is currently funded by: The Bright Futures Trust, the Child Growth Foundation, the EarlyBird Diabetes Trust, GSK, the Kirby Laing Foundation, Nestle, Novo Nordisk.

## T5:PS.23

**Effects of Capsaicin, Green tea and CH-19 sweet pepper on appetite and energy intake in humans in negative and positive energy balance**

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**Background:** Capsaicin, catechins, caffeine and CH-19 sweet pepper have been shown to stimulate energy expenditure and fat oxidation and to some extent reduce appetite and energy intake. These effects might depend on energy balance.

**Objectives:** To investigate how capsaicin, green tea, CH-19 sweet pepper as well as green tea and capsaicin added to three daily meals during respectively negative and positive energy balance affect appetite and energy intake.

**Design:** 27 subjects were randomized to three weeks of negative energy balance and three weeks of positive energy balance during which they received: 1) capsaicin, 2) green tea, 3) CH-19 sweet pepper 4) capsaicin + green tea and 5) placebo treatment. The effects on appetite and desires (100 mm VAS), energy intake (kJ), body weight and heart rate were assessed.

**Results:** CH-19 sweet pepper and a combination of capsaicin and green tea were found to reduce energy intake more during positive than negative energy balance, whereas capsaicin and green tea given individually increased fullness during negative and reduced hunger during positive energy balance. The effect of CH-19 sweet pepper on appetite was less evident. Capsaicin and green tea in combination were found to suppress hunger and increase satiety in both energy conditions however larger effects on appetite were found during negative energy balance.

**Conclusion:** Thermogenic food ingredients induce greater energy intake effects when used in combinations, and when used in positive energy balance. We conclude that they may rather contribute to prevention than to treatment of overweight and obesity.

**Funding:** Research relating to this abstract was funded by the Danish Meat Research Institute and the Danish Ministry of Science, Technology and Innovation.

## T5:PS.22

**Association of body size and muscle strength with incidence of coronary heart disease and cerebrovascular diseases: a population-based cohort study of one million Swedish men**

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**Background:** Previous studies have suggested that body size and muscle strength are associated with risk of coronary heart disease (CHD) and stroke, but probably because of low number of cases discrepancy exists in previous results.

**Methods:** Height, weight, systolic (SBP) and diastolic blood pressure (DBP) as well as elbow flexion, hand grip and knee extension strength were measured from 1,157,750 Swedish men born between 1951 and 1975 during conscription examination in young adulthood. During the register based follow-up until the end of 2006, 12,323 CHD and 8,865 stroke cases emerged including 1,431 intracerebral hemorrhage, 1,316 subarachoid hemorrhage and 2,944 intracerebral infarction cases. Hazard ratios (HR) per one standard deviation with 95% confidence intervals (95% CI) were computed using Cox proportional hazard model.

**Results:** Body mass index (BMI, kg/m<sup>2</sup>) showed increased risk with CHD and intracerebral infarction whereas for hemorrhagic stroke both under- and overweight were associated with increased risk. Height was inversely associated with CHD and all types of stroke. After adjustment for height, BMI, SBP and DBP, high knee extension strength was associated with decreased risk of CHD (HR=0.92 95% CI 0.91-0.94), intracerebral hemorrhage (HR=0.92 95% CI 0.86-0.97), subarachoid hemorrhage (HR=0.92 95% CI 0.86-0.98) and intracerebral infarction (HR=0.93 95% CI 0.90-0.98) whereas hand grip strength showed weaker association and elbow flexion strength no or positive association.

**Conclusions:** Body size and muscle strength in young adulthood are important predictors of further CHD and stroke risk. In addition to adiposity, underweight needs attention since it may predispose to cerebrovascular complications.

## T5:PS.24

**Accuracy and correlates of maternal recall of birth-weight and gestational age**

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**Background:** Links have been made between birth-weight (BW) and gestational age (GA) and health in child-and-adulthood. Because studies may rely on maternal recall, it is important to evaluate the quality of this information.

**Objective:** To determine the accuracy of maternal recall of children BW and GA, using the Danish Medical Birth Register (DBR) as reference and to examine the reliability of recalled BW and its potential correlates.

**Method:** The accuracy studies of BW and GA were composed respectively of 1271 and 678 mothers of schoolchildren, who participated the European Youth Heart Study. The reliability sample of BW was composed of 359 women. The agreement between the two sources was evaluated by mean differences (MD), intra-class correlations (ICC) and Bland-Altman's plots. Misclassification of the various BW and GA categories were also estimated.

**Results:** There was high agreement between recalled and registered BW (MD = -0.2 g; ICC = 0.94) and GA (MD = 0.3 wk; ICC = 0.76). Only 1.6% of BW would have been misclassified into low, normal or high BW and 16.5% of GA would have been misclassified into pre-term, term or post-term based on maternal recall. The logistic regression revealed that the most important variables in the discordance between recalled and registered BW were ethnicity and parity. Maternal recall of BW was highly reliable (MD = -5.5 g; ICC = 0.93), and reliability remained high across subgroups.

**Conclusion:** Maternal recall of BW and GA can provide accurate information for clinical and epidemiological use regarding fetal and infant growth.

## T5:PS.25

**Overweight and change in overweight status during childhood and asthma at 8 years. A longitudinal birth cohort study**Scholtens, S<sup>1</sup>, Wijga, AH<sup>2</sup>, Seidell, JC<sup>3</sup>, Brunekreef, B<sup>1,4</sup>, de Jongste, JC<sup>5</sup>, Kerkhof, M<sup>6</sup>, Hoekstra MO<sup>7</sup>, Postma, DS<sup>8</sup>, Smit, HA<sup>2,4</sup><sup>1</sup>Institute for Risk Assessment Sciences, Utrecht University, Utrecht, The Netherlands<sup>2</sup>Centre for Prevention and Health Services Research, National Institute for Public Health and the Environment, Bilthoven, The Netherlands<sup>3</sup>Vrije Universiteit, Amsterdam, The Netherlands<sup>4</sup>Julius Centre for Health Sciences and Primary Care, University Medical Centre Utrecht, The Netherlands<sup>5</sup>Department of Paediatrics, Division of Respiratory Medicine, Erasmus MC – Sophia, Rotterdam, The Netherlands<sup>6</sup>Department of Epidemiology and Bioinformatics, University of Groningen, Groningen, the Netherlands<sup>7</sup>Centre for Paediatric Allergology, Wilhelmina Children's Hospital, Utrecht, The Netherlands<sup>8</sup>Department of Pulmonology, University Medical Centre Groningen, University of Groningen, Groningen, The Netherlands

Asthma may be increased in overweight children. The effect of change in overweight status on the asthma risk is unclear.

We studied 3756 Dutch children born in 1996/1997 who participated in the PIAMA (Prevention and Incidence of Asthma and Mite Allergy) birth cohort study. Weight and height were reported by the parents in yearly questionnaires. A high body mass index (BMI) was defined as a BMI standard deviation score above the 85th percentile. Data on current asthma, defined as wheeze, dyspnea, and/or a prescription of inhaled steroids, were collected yearly. Specific IgE to airborne allergens and bronchial hyperresponsiveness (BHR) were determined at 8 years of age. Data were analysed by logistic regression. At 8 years of age, 529 children (14.1%) had asthma in the last year. Children who had a high BMI at 6-7 years had a higher risk of asthma (adjustedOR: 1.58; 95%CI: 1.18-2.12; p=0.002) and BHR (adjustedOR: 1.74; 95%CI: 1.15-2.63; p=0.009) at 8 years. Children who had a high BMI at earlier ages and a normal BMI at 6-7 years did not have an increased risk of asthma and BHR at 8 years. The associations could not be explained by confounding factors. BMI was not associated with a positive specific IgE at 8 years (adjustedOR: 0.99; 95%CI: 0.60-1.65; p=0.977). In conclusion, children with a high BMI at age 6-7 had an increased risk of asthma and BHR at 8 years. Early high BMI was not associated with asthma in children who had a normal BMI at 8 years.

**Funding:** This work was supported by the Netherlands Organisation for Health Research and Development, the Netherlands Asthma Foundation, the Netherlands Ministry of Health, Welfare and Sport and Numico Research, the Netherlands.

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## T5:PS.27

**Comparing trends in body mass index and waist circumference**Walls HL<sup>1</sup>, Wolfe R<sup>1</sup>, de Courten M<sup>1</sup>, Reid CM<sup>1</sup>, Magliano DJ<sup>1,2</sup>, McNeil JJ<sup>1</sup>, Peeters A<sup>1</sup><sup>1</sup>Monash University, Melbourne, Australia; <sup>2</sup>International Diabetes Institute, Melbourne, Australia

Recent analyses suggest differences in the trends of body mass index (BMI) and waist circumference (WC). The implication is that the nature of excess body weight may be changing to one of greater abdominal obesity. Considering the stronger association of WC with metabolic and cardiovascular risk, this has implications for the burden of obesity-related disease. We analysed trends in BMI and WC (using data from the 1989 National Heart Foundation Risk Factor Prevalence Study, 1995 National Nutrition Survey and 1999-2000 AusDiab Survey), focusing on their distributional shifting, changes in skewedness, and changes in the prevalence of risk categories of each. We found that mean BMI increased between 1989 and 2000 by 0.7kg/m<sup>2</sup> in males and 1.1kg/m<sup>2</sup> in females, and mean WC by 4.7cm in males and 5.7cm in females. To explore differences in the increase, we compared the proportions of the population in 2000 that were above the 1989 median BMI and WC – 66% for BMI; 58% for waist, and compared z-scores. The rightwards distributional shifts between 1989 and 2000 were significantly greater for WC than BMI, but the degree of this difference differed by age, sex and BMI level. Greater skewing occurred for BMI than WC. Within all BMI categories – even those considered ‘normal’ – the prevalence of ‘low risk’ WC decreased and the prevalence of ‘substantially increased risk’ WC increased. Our results suggest that the nature of excess body weight may be changing over time, and provide insight into the relative utility of BMI and WC risk categories.

## T5:PS.26

**Body sizes in print media: are there ethnic differences?**

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**Introduction:** Exposure to ultra-thin images in magazines has been associated with low self esteem and body dissatisfaction in young women. Black women are more likely to be satisfied with their body size despite higher rates of overweight and obesity. This study tested the hypothesis that models in magazines aimed at black women would be larger than models in similar print materials aimed at the general population.

**Participants and methods:** All evaluable pictures of women (at least quarter page, body size visible) from March-May 2007 issues of three popular British fashion magazines aimed at black women (Essence, Black Beauty, Pride) were compared with pictures from three general fashion magazines (Glamour, Instyle, Cosmopolitan). In the absence of established methods to assess the body size of pictures, we used ratings by 42 female raters (21 white, 21 black) who matched each picture to one of four drawings depicting very thin to normal-weight women.

**Results:** Across the board, most pictures depicted thin women (estimated BMIs from 17-21). Using a scale from 1-4, the mean size of pictures from ‘black’ magazines was significantly higher than for general magazines, averaging 2.34 ± 0.33 and 2.18 ± 0.36 respectively (t = 5.55, p < 0.001). 22% of the pictures from general magazines were in the thinnest size category, compared with 10.2% of pictures from black magazines (p < 0.001).

**Conclusion:** Media aimed at black women is less likely to use extremely slim models. This could contribute to higher body satisfaction in black women.

## T5:PS.28

**The rs9939609 *FTO* gene in relation to all-cause mortality in a prospective cohort study of Danish men**Zimmermann, E<sup>1</sup>, Jess T<sup>1</sup>, Kring SII<sup>1</sup>, Berentzen T<sup>1</sup>, Holst C<sup>1</sup>, Hansen T<sup>2</sup>, Pedersen O<sup>3</sup>, Astrup A<sup>3</sup>, Sørensen, TIA<sup>1</sup><sup>1</sup>Institute of Preventive Medicine, Copenhagen University Hospital, Centre for Health and Society, Copenhagen, Denmark; <sup>2</sup>Steno Diabetes Center, Gentofte, Copenhagen, Denmark; <sup>3</sup>Institute of Human Nutrition, Faculty of Life Sciences, University of Copenhagen, Denmark

**Introduction:** The A-allele of *FTO* rs9939609 associates with obesity in several large cohorts. Since obesity is associated with increased mortality, the aim was to investigate whether this SNP is associated with all-cause mortality, indicating a causal effect of the SNP associated fat mass on mortality.

**Methods:** The study population consisted of 362,200 men appearing at the Danish draft boards between 1943 and 1977. All obese men with a body mass index (BMI) ≥ 31.0 kg/m<sup>2</sup> (n=1,930), and a non-obese control group consisting of a 1% random sample of the study population (n=3,601) were selected. All obese and half of the control men were invited to the Copenhagen City Heart Study (CCHS) in 1991-94. Of these, 1,622 individuals (hereof 749 obese) were genotyped using Taqman allelic discrimination. Cox regression models were used, with age at CCHS as the underlying time scale. Follow-up ended on September 1<sup>st</sup> 2000, but will be extended.

**Results:** Among the 1,622 individuals under study, 477 were wildtype, 797 were heterozygous and 348 were homozygous for the T to A change of rs9939609. During follow-up 75 subjects died. The hazard ratio for mortality was 1.33 (95% CIs 0.75-2.36) among the heterozygous and 1.75 (95% CIs 0.90-3.39) among the homozygous carriers compared to wildtypes. Adjusting for baseline BMI or fat-BMI eliminated these associations.

**Conclusion:** There is a tendency that homozygous carriers of the *FTO* SNP have an increased mortality rate compared to wildtypes, indicating that the increased BMI associated with the SNP may translate into an increased mortality.

## T5:PS.29

**Longterm changes in BMI growth charts pattern for Czech children and adolescents**Vignerová, J<sup>1</sup>, Paulová, M<sup>1</sup>, Brabec, M<sup>1,3</sup>, Bláha, P<sup>2</sup><sup>1</sup> National Institute of Public Health, Prague, Czech Republic; <sup>2</sup> Faculty of Science, Charles University, Prague, Czech Republic; <sup>3</sup> Institute of Computer Science, Academy of Sciences, Prague, Czech Republic

The Czech Republic has undergone rapid political, social, and economic transformation since the late 1980's. While obesity rates among children and adolescents have been rather low previously, situation changed recently, as we can document on large data coming from country-wide anthropological surveys that have been conducted in the Czech Republic regularly (in 10-year intervals) for more than 50 years.

We will show (secular) time dynamics of 50<sup>th</sup>, 90<sup>th</sup> and 97<sup>th</sup> BMI percentiles (obtained from LMS and/or its more recent counterparts like GAMLSS). Secular BMI distribution changes are not homogeneous, stressing that different parts of the youth population are subject to different obesity risks. The most dramatic changes have been observed among school-aged children, where BMI-for-age values have increased at the 50th, 90th, and 97th percentiles. In contrast, adolescent girls are thinner.

In addition to the overall BMI-for-age curve behaviour, we investigate adiposity rebound (AR) as one of its important features. AR evidently shifts to earlier ages in the Czech population over last 50 years. On the other hand, shape of the BMI-for-height curve has not changed substantially. We will demonstrate (by means of modern functional data analysis techniques) that in the Czech population, a lot of "general obesity increase" (except perhaps for extreme categories) is tight to secular height changes. This illustrates importance of proper height adjustment in the historical population obesity assessments – especially when non-negligible secular height trend is present. This research is supported by the grant No. NR/7857-3 from the Internal Grant Agency, Ministry of Health.

## T5:PS.31

**Relationship between peroxisome proliferator-activated receptor- $\gamma$  (ppar- $\gamma$ ) pro12Ala polymorphism and insulin sensitivity depends on fish consumption in adolescents**Copin, N<sup>1</sup>, Platat, C<sup>1</sup>, Bedel, JF<sup>2</sup>, Oujaa, M<sup>1</sup>, Lacorte, JM<sup>3</sup>, Clément, K<sup>2</sup>, Simon, C<sup>1</sup>.<sup>1</sup> EA 1801, Université Louis Pasteur, Faculté de médecine, 67085 Strasbourg, France  
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The Pro12Ala peroxisome proliferator-activated receptor- $\gamma$  (PPAR- $\gamma$ ) polymorphism is associated with insulin sensitivity in adults. Fish and fish oil intake have health benefits.

The objective of the study was to determine whether fish consumption interacts with the Pro12Ala polymorphism in the relation with insulin sensitivity.

The study was a cross-sectional analysis of ICAPS' baseline data (a randomized trial designed to prevent overweight in adolescents). 573 children were genotyped for the Pro12Ala polymorphism. Fish consumption was determined by use of a food-frequency questionnaire.

Compared to Pro/Pro homozygotes, the presence of the 12Ala allele was significantly associated with lower HOMA (1.81±0.11 vs. 2.02±0.06 in Ala allele carriers vs. Pro homozygotes,  $p=0.016$ ) after adjustment for age, gender, sexual maturity, parents' socio-occupational status, participation in leisure-time organized PA and body fat. When the effect of fish consumption on HOMA was further investigated, a significant interaction between fish consumption and the Pro12Ala polymorphism was found ( $p=0.039$ ) such that the Ala allele was associated with lower HOMA in regular fish consumers while no difference was seen in low fish consumers. Plasma phospholipids FA composition were analysed in a subsample ( $n=283$ ) of subjects. Regular fish eaters had significantly heightened plasma DHA and n-3 PUFA compared to low fish consumers. However neither of the plasma FA interacted with the Pro12Ala polymorphism on HOMA.

Although the 12Ala allele may protect adolescents against insulin resistance, this effect may depend on diet characteristics, especially PUFA from fish, the mechanism of which remains to be determined.

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## T5:PS.30

**Increasing prevalence of obesity in the Seychelles and association with socio-economic status**Bovet, P<sup>1,2</sup>, Chioléro, A<sup>2</sup>, Gabriel, A<sup>1</sup>, Marques-Vidal, P<sup>1,3</sup> and Paccaud, F<sup>2</sup><sup>1</sup> Section of Non Communicable Diseases, Ministry of Health and Social Development, Victoria, Republic of Seychelles; <sup>2</sup> Institute of Social and Preventive Medicine (IUMSP), University of Lausanne, Switzerland<sup>3</sup> Cardiomet, CHUV, Lausanne, Switzerland

**Objective:** We assessed the 15-year trends in the distribution of body mass index (BMI) categories in the Seychelles (Indian Ocean, African Region) and the relationship with sex, age and socio-economic status (SES).

**Methods:** We conducted three population-based examination surveys in 1989 ( $n=1,081$ ; participation rate: 86.4%), in 1994 ( $n=1,067$ ; 87.0%), and in 2004 ( $n=1,255$ ; 80.2%). Occupation was categorized as "laborer", "intermediate" or "professional". Results are adjusted to the population of 2002.

**Results:** Between 1989 and 2004, mean BMI increased markedly in all sex and age categories (overall:  $-0.15$  kg/m<sup>2</sup>/calendar year). The prevalence of overweight and obesity combined ("excess weight", BMI  $\geq 25$  kg/m<sup>2</sup>) increased from 29% to 52% in men and from 50% to 67% in women. The prevalence of obesity (BMI  $\geq 30$  kg/m<sup>2</sup>) increased from 4% to 15% in men and from 23% to 34% in women. Mean BMI - respectively the prevalence of excess weight - was lower in laborers than professionals in men but higher in laborers than professionals in women and this pattern was similar in the three surveys. Odds ratios for excess weight in professionals vs. laborers were 2.10 (95% CI: 1.94-2.17) in men and 0.51 (0.48-0.53) in women, adjusting for calendar year and participants' age and smoking habits.

**Conclusion:** The prevalence of overweight/obesity increased markedly during a 15-year period. Similar increase of BMI over time in all age and sex categories suggests common environment obesogenic factors. The association between SES and excess weight was in opposite directions in men and women. The study emphasizes the need for prevention measures in all sex, age and SES groups, and suggests that they should be tailored according to sex and SES categories.

## T5:PS.32

**Current provision of weight and height measuring equipment in a primary care setting in Scotland and implications for obesity management programmes.**Kulkarni, UV<sup>1</sup>, Subramani, S<sup>2</sup>, Brown, J<sup>3</sup> Broom J<sup>1,3</sup><sup>1</sup> The Robert Gordon University, Aberdeen, Scotland; <sup>2</sup> University of Aberdeen, Aberdeen, Scotland<sup>3</sup> NHS Grampian, Aberdeen, Scotland

**Introduction:** The National Health Service (NHS) Grampian Health Board is served by 90 general practices and covers a population of approximately 526000 in the north-east of Scotland. We aimed to determine if the current provision of height and weight measuring devices was sufficient for obesity management in this primary care setting.

**Methods:** All 90 practices were surveyed and 77 (86%) responded. Data was collected by telephone or fax.

**Results:** The number of weighing machines at each practice varied between 2 and 20. The maximum weighing capacity within the practice was identified by 51 respondents and ranged from 127kg to 250kg. Only 25% of practices had at least one scale that measured beyond 150kg. 45 respondents (58%) indicated that new scales would be beneficial to their practice. 22 of these practices (49%) cited a need to conveniently measure and monitor weight change in very heavy patients, including a third of practices that already had at least 1 scale that measured >150kg. Reasons in the latter group included practicalities such as patients having to be escorted elsewhere within the practice to be weighed. Other reasons included avoiding embarrassment caused to patients unable to be weighed, and the potential benefit in obesity management.

**Conclusion:** Obesity prevalence is increasing worldwide, and an increasing number of health programmes are being created to address this. However, without adequate facilities to measure and monitor weight and BMI changes of the overweight and obese, these health programmes will not be able to achieve proper implementation or success.

## T5:PS.33

**Genome-wide scan for obesity and obesity related traits in a large filipino family supports genetic etiology of metabolic syndrome and sleep apnea**Relf, B<sup>1</sup>, Larkin, EK<sup>2</sup>, de Torres, C<sup>3</sup>, Baur, LA<sup>1,3</sup>, Christodoulou, J<sup>1,3</sup>, Waters, KA<sup>1,3</sup><sup>1</sup> Discipline of Paediatrics and Child Health, University of Sydney, Sydney, Australia<sup>2</sup> Center for Clinical Investigation, Case Western Reserve University, Cleveland, OH, USA<sup>3</sup> The Children's Hospital at Westmead, Sydney, Australia

**Rationale:** Metabolic syndrome (MeS), sleep apnea (SA), and obesity are complex phenotypes under polygenic control. To further explore the genetic pathways underlying these diseases in a unique ethnic population, we performed a linkage scan on a single Filipino family with a high prevalence of MeS, SA and obesity related traits.

**Methods:** A large rural family (N=50, 50% adults) underwent a 10 cM genome-wide scan. Fasting blood was used to measure insulin (INS), triglycerides (TG), total cholesterol and HDL cholesterol (HDL). Attended overnight polysomnography was used to quantify the respiratory disturbance index (RDI), a measure of SA. BMI z-scores and HOMA-IR scores were calculated. Variance component linkage analyses were conducted in SOLAR on transformed traits, adjusting for age and sex. **Results:** 38% were obese, 10% had diabetes and 46% had elevated RDI. Linkage peaks with LOD scores >1.5 were demonstrated for BMI on chromosomes 3q (LOD=1.6), 12q (LOD=1.54), 16q (LOD=1.71), and 19q (LOD=1.50) and for HOMA and INS on 2q (LOD=1.68), 4q (LOD=1.77), 21q (LOD=1.51) and 22q (LOD=1.68). Linkage to HDL was seen on chromosome 7q36 (LOD=2.54). The highest peaks for RDI were observed on chromosome 9 (LOD=1.35) and 15 (LOD=1.00) and for TG on chromosome 10 (LOD 1.51).

**Conclusion:** This first report of MeS traits and SA in a Filipino family confirmed previously observed linkage peaks and identified novel linkages. This scan provides evidence for underlying genes in MeS and SA with candidate genes involved in the regulation of glucose and lipid homeostasis.

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## T5:PS.35

**Socioeconomic differences in risk factors for childhood obesity in a multi-ethnic population**Shohaimi, S<sup>1</sup>, Tung, S<sup>1</sup>, Wan Azlina, WA<sup>1</sup> and Siti Salwani, AR<sup>1</sup>

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The association between socioeconomic status and childhood obesity is well-established. However, the influence of socioeconomic status on risk factors of obesity in children has not been thoroughly explored particularly in a multi-ethnic population. The purpose of this study was to investigate if risk factors of childhood obesity such as diet and sedentary activities differ by socioeconomic status. The present study is a cross-sectional population-based study of 1411 schoolchildren of various ethnicities aged between 10-12 years old. Habitual dietary intake, physical activity and sedentary behaviours were measured using questionnaires administered by trained enumerators. Body Mass Index (BMI) was used as an indicator of obesity. 10.1% of the schoolchildren were obese while 15.2% were overweight. Prevalence of obesity was significantly higher among boys (11.7%) compared to girls (8.7%). Children from families with high monthly income had significantly higher BMI (19.1 kg/m<sup>2</sup>) compared to those from families with medium or low monthly income (18.2 and 18.3 kg/m<sup>2</sup>) respectively. Children of high income families spend significantly less time playing outdoor games and more time watching television. They were also more likely to skip breakfast and consume fast food and soft drinks more frequently than children of lower income families. Intervention strategies and methods to promote healthy behaviours in children must take into consideration socioeconomic status which may contribute to the observed differences in the prevalence of obesity among children in Malaysia. Research related to this abstract was funded by the Sciencefund grant (project number 06-01-04-SF0460) of the Malaysian Ministry of Science, Technology and Environment.

## T5:PS.34

**Community-based diabetes prevention program by health care supporter: A 2-year follow-up.**Sakane N<sup>1</sup>, Sano Y<sup>1</sup><sup>1</sup> National Hospital Organization Kyoto Medical Center, Kyoto Japan

**Background:** Weight loss and exercise habits are effective to prevent or delay type 2 diabetes.

**Objective:** This study evaluated a community-based diabetes prevention program by health care support for increased physical activity and weight loss in community-dwelling people. The study was a cluster-randomized-controlled trial based on the residential area as the unit of randomization.

**Methods:** In each intervention residential area, volunteer health supporters were selected. After education in leadership, practice, and first aid, the 96 volunteers ran an organized healthy walking campaign and walking groups at several community centers. Emphasis was placed on the integration of walking into daily routines. Subjects in the control residential area received health information only. To evaluate lifestyle habits, each subject completed a self-administered questionnaire. The primary endpoint was the incidence of diabetes evaluated by the use of anti-diabetic agents.

**Results:** At baseline, there is no difference in age, sex, BMI or exercise habits between the intervention groups (n=942) and control group (n=354). The walking time and steps significantly increased in the intervention group after a 2-year intervention program, while those in the control group did not change. The time for watching television was significantly decreased in the intervention group, although those in the control group had not changed. The mean BMI was significantly decreased in the intervention group, but the mean BMI did not change in the control group.

**Conclusion:** This program may be an effective method of increasing physical activity and a promoting weight reduction in the community.

## T5:PS.36

**Obesity and undernutrition – africa's double burden of disease**Walsh CM<sup>1</sup>, Van Rooyen FC<sup>2</sup>.<sup>1</sup> Departments of Dietetics and Human Nutrition and <sup>2</sup> Biostatistics, Faculty of Health Sciences, University of the Free State, Bloemfontein, South Africa

**Introduction:** Malnutrition (both undernutrition and overnutrition) remains a significant public health challenge in Africa. The Assuring Health for All in the Free State (AHA FS) study is an epidemiologic study that aims to provide an estimate of the disease burden attributable to infectious diseases and undernutrition on one hand and obesity and its comorbidities on the other. The aim of this sub-study was to determine anthropometric nutritional status of rural children and adults in the Southern Free State province of South Africa.

**Methodology:** Anthropometric data was collected for all participants (adults 25-64 years and pre-school children) who gave informed consent in Trompsburg, Philippolis and Springfontein, using standard measuring techniques.

**Results:** Data was collected for 598 participants (390 female, 163 male, 45 children). More than half (66%) of females were overweight and obese (BMI >25kg/m<sup>2</sup>). In men, 23% were overweight and obese, 44% had a normal body mass index (BMI 18.5-24.9 kg/m<sup>2</sup>), while 33% were underweight (BMI <18.5kg/m<sup>2</sup>). In children, prevalence of underweight (weight-for-age <-2SD) was high at 47%, stunting (height-for-age <-2SD from NCHS median) was 35%, and wasting (weight-for-height <-2SD) 19%. In households with overweight and obese adults (n=31), a high percentage of children were malnourished (46% underweight, 23% stunted and 29% wasted).

**Conclusion:** The results confirm that a double burden of disease is common in these communities. The mechanisms by which undernutrition predisposes children (especially girls) to developing obesity in adulthood need to be investigated. Nutrition intervention programmes need to target both undernutrition and obesity in these rural areas.

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## T5:PS.37

**Is childhood obesity a concern for mothers of toddlers aged between 1 and 4? Project HELP (Healthy Eating and Lifestyle for Parents)**Wordley, J<sup>1</sup>, Borkoles, E<sup>2</sup>, Sahota, P<sup>1</sup> and Dixey, R<sup>1</sup><sup>1</sup> Faculty of Health, Leeds Metropolitan University, Leeds, UK<sup>2</sup> Carnegie Faculty of Sport & Education, Leeds Metropolitan University, Leeds, UK

**Background:** This study was conducted as an exploratory phase for the development of HELP, a Children's Centre-based healthy eating intervention targeting parents of toddlers. Staff and parents attending 4 Children's Centres in the North of England participated in the study to determine parental feeding practices, concerns, attitudes and knowledge about childhood obesity so that the intervention could be targeted more specifically to the parents needs and meet the project aim of reducing risk factors associated with the development of childhood obesity.

**Method:** 4 staff focus group sessions were conducted with 15 staff in each Centre. Additionally 5 focus groups were conducted with a total of 26 parents. A further 7 parents were interviewed individually across the Centres. All focus group sessions and interviews were audiotaped, transcribed and analysed using thematic content analysis.

**Results:** This study's parents were not overly concerned about obesity in their toddlers. It was found that they were more concerned about their child being underweight or have 'picky' eating tendencies. Parents felt under pressure because of their health professionals' attitude to 'failing to thrive' children and threat of social surveillance.

**Conclusions:** Parents feel powerless to feed their child adequately due to 'picky' eating tendencies and thus are receptive to constructive advice. Future interventions need to highlight that 'picky' eating is a normal part of preschoolers' development. The HELP intervention aims to enhance parental self-efficacy by building on their current knowledge to achieve successful healthy eating behaviour change.

## T5:PS.39

**Attitudes of parents in a multiethnic society towards physical activity for their obese child: a pilot study.**Bernard-Bonnin, AC<sup>1</sup>, Domken, V<sup>1</sup>, Chevalier, I<sup>1</sup>, Sterescu AE, Chevalier I, Rousseau, E<sup>1</sup>, Pelletier, V<sup>1</sup>, and Sirard, A<sup>1</sup>Affiliations <sup>1</sup> CHU Ste-Justine, University of Montreal, Montreal, Canada

**Objective:** Because attitudes regarding physical activity for obese children may vary amongst immigrant (IP) and non-immigrant parents (NIP), the aim of this study was to compare attitudes of both groups towards physical activity and sedentariness.

**Methods:** Families of children referred to the nutrition clinic at a tertiary care Canadian pediatric hospital were recruited upon their first visit, after anthropometric data confirmed obesity. At least one parent per family was interviewed with a standardized questionnaire on sociodemographic status and attitudes towards physical activity. Responses of IP were compared with those of NIP parents.

**Results:** The sample consisted of families of 43 children. Mean age of the children was 11.9 years (SD 2.5); 58.1% were girls. Mean BMI was 32.9 kg/m<sup>2</sup> (SD 5.1); mean z-score for BMI was 2.39 (SD 0.26). Responses were obtained from NIP in 30 (69.8%) instances and from IP in 13 (30.2%) instances. All IP and 90.0% of NIP correctly identified lack of physical activity as a cause of obesity in children (p=0.2), while 69.2% of IP and 80.0% of NIP identified excessive TV and computer games as causative (p=0.4). Seventy percent of IP compared to 60.0% NIP described their child as "not very" or "not athletic" (p=0.9). Seventy seven percent of IP and 86.7% of NIP said they often or always stimulated their child to exercise (p=0.6). Thirty one percent of IP and 33.3% of NIP said they often or always exercised with the child to encourage physical activity in their child (p=0.8). When asked whether the following items were reasons preventing the child from doing sports, 72.7% of IP and 64.3% of NIP identified lack of a person to accompany the child (p=0.6); 58.3% and 60.7% identified "the child tires too quickly" (p=0.9); 53.8% and 63.3% identified "the child doesn't want to, he prefers television or computers" (p=0.6).

**Conclusion:** Both immigrant and non-immigrant parents of obese Canadian children acknowledge lack of physical activity as a contributor to obesity. Despite this, both groups of parents perceive their children as sedentary. Barriers to physical activity in obese children need to be addressed in a family context.

## T5:PS.38

**Is threat from societal pressures driving health behaviours of mothers of toddlers aged between 1 and 4? Project HELP**Wordley, J<sup>1</sup>, Borkoles, E<sup>2</sup>, Sahota, P<sup>1</sup> and Dixey, R<sup>1</sup><sup>1</sup> Faculty of Health, Leeds Metropolitan University, Leeds, UK<sup>2</sup> Carnegie Faculty of Sport & Education, Leeds Metropolitan University, Leeds, UK

**Background:** This study was conducted as an exploratory phase for the development of HELP, a Children's Centre-based healthy eating intervention targeting parents of toddlers. Staff and parents attending 4 Children's Centres in the North of England participated in the study to determine parental feeding practices, concerns, attitudes and knowledge about childhood obesity so that the intervention could be targeted more specifically to the parents needs and meet the project aim of reducing risk factors associated with the development of childhood obesity.

**Method:** 4 staff focus group sessions were conducted with 15 staff in each Centre. Additionally 5 focus groups were conducted with a total of 26 parents. A further 7 parents were interviewed individually across the Centres. All focus group sessions and interviews were audiotaped, transcribed and analysed using thematic content analysis.

**Results:** This study's parents showed limited knowledge about risks and implications of childhood obesity, and benefits of a healthy diet. Their choices simply reflected how good a mother they perceived themselves to be and how they felt their parental efforts were perceived by significant others. There was a fear that their child would be taken into care and there was a social stigma of having social services involved.

**Conclusions:** Further research is needed to explore what motivates parents to adopt healthier eating behaviours and to understand how societal forces drive these behaviours. If parents are choosing to behave healthily because of societal threat, future interventions need to address this phenomenon clearly.

## T5:PS.40

**"They value being fatter": Dissonance between health professional and lay concepts of fatness and its relation to diabetes risk in a South Asian Community**Grace, C<sup>1</sup>, Begum, R<sup>2</sup>, Subhani, S<sup>2</sup>, Greenhalgh, T<sup>3</sup>, Kopelman, P<sup>4</sup>.<sup>1</sup> Queen Mary University of London, London, United Kingdom; <sup>2</sup> Tower Hamlets Primary Care Trust, London, United Kingdom; <sup>3</sup> University College London, London, United Kingdom; <sup>4</sup> University of East Anglia, Norwich, United Kingdom

**Background:** Recent findings suggest UK Bangladeshis view obesity as unhealthy and linked to diabetes. This is contrary to the stereotype of South Asians valuing fatness. We explored whether health professionals recognized that overweight is considered indicative of ill-health in this minority ethnic group.

**Methods:** 80 Bangladeshi men and women, without diabetes, participated in 10 focus groups, purposively selected for generation, age and BMI. Groups were conducted in Sylheti or English, recorded & transcribed. Nine standard body images, ranging from underweight to obese, facilitated exploration of beliefs about weight and diabetes risk. Lay participants identified figures with the worst/best health and most/least likely to develop diabetes together with their associated reasoning. 24 health professionals [nurses, dietitians, health advocates, doctors] participated in 3 focus groups and identified what they believed lay participant's choice of figures would have been. Data were analysed by thematic content analysis using the constant comparative method.

**Results:** 1<sup>st</sup> and 2<sup>nd</sup> generation lay participants suggested obesity reflected poor lifestyle choices and increased diabetes risk. Middle sized figures were considered the healthiest. Conversely many health professionals believed lay participants linked obesity with health, fertility and wealth. Others were unclear of lay perceptions reporting time constraints, language difficulties or trust issues precluded exploration and understanding of this area. Health advocates highlighted the changes that had occurred in community views on fatness and health over the last 30-40 years.

**Conclusions:** This mismatch between health professional and lay views on weight and diabetes risk has important implications for health education and health professional training.

**Funding:** Research relating to this abstract was funded by Diabetes UK

## T5:PS.41

**Attitudes toward body size among 10-year-olds in Sweden – a nationwide population-based study.**Hansson, LM<sup>1</sup>, Tynelius, P<sup>1</sup>, Rasmussen, F<sup>1</sup>.<sup>1</sup>Department of Public Health Sciences, Karolinska Institutet, Sweden.

**Aims:** The aim was to investigate children's attitudes toward different body sizes of different sex. We also explored possible effects of children's sex, body size, place of residence, and parental education on attitudes toward body size.

**Methods:** A nationally representative sample of children born in 1995 was sent a questionnaire in 2005. Attitudes toward body size were measured by children attributing positive and negative adjectives to figures of a thin, average and fat body size. More negative than positive adjectives assigned to the figure indicated a negative attitude. The analysis included 1409 children.

**Results:** Almost 70% of the children regarded the fat figure as lazy, whereas only 6% and 18% attributed this to the average respectively the thin figure. There was a strong association between the body size of the figure being rated and the probability that the children were negative ( $\chi^2_{adj}=858$ ,  $p<.0001$ ). Children were 20.5 (95% CI 16.0-25.7) times more likely to be negative to the thin figure compared to the average figure and 52.9 (41.7-67.6) times more likely to be negative to the fat figure compared to the average figure. In turn, the fat figure was more negatively judged compared to the thin figure, OR=2.6 (95% CI 2.3-2.9). BMI, parental education or urban-rural residence did not affect attitude scoring.

**Conclusion:** To deviate from the weight norm increases the risk of being judged negatively, especially if fat. However, not all children hold negative attitudes and studies are needed to determine potential causes of children's attitudes toward body size.

**Funding:** Research relating to this abstract was funded by The Swedish Foundation for Health Care Sciences and Allergy Research (The Vårdal Foundation), Stockholm, Sweden.

## T5:PS.43

**Taste preference, Appetite and Obesity index, Calorie intake in Korean**Kwang Min Kim<sup>1</sup>, Sang Man Kim<sup>2</sup>, Nam Suck Joo<sup>1</sup><sup>1</sup> Department of Family Medicine, Ajou University College of Medicine, Suwon, Korea<sup>2</sup> Cha Biomedical Center, Joongmoon University College of Medicine, Seoul, Korea

**Objective:** Tastes of foods and appetite are driving forces for foods consumption. We investigated obesity index differences and calorie intake amount according to grade of appetite and tastes preference.

**Methods:** A total of 688 Korean from May 2006 to February 2007 were examined. We investigated the preferences for spicy and salty taste and grade of appetite by self-administered questionnaires. 24 hour recall method was used to measure total calorie. Statistical analyses were conducted with using SPSS version 11.5.

**Results:** In women, Body mass index(BMI) was greater in good appetite group than poor appetite group, but there was no difference in waist circumference(WC) among 3 appetite groups. Calorie intake trended to upward according to grades of appetite.

In Men, WC, weight and prevalence of obesity were greater in good appetite than ordinary appetite group, and BMI and calorie intake amount trended to upward according to grades of appetite. WC, BMI, weight and prevalence of obesity were greater in salty taste preference than ordinary taste preference group, but there was no difference in calorie intake according to salty taste. WC, BMI, weight, prevalence of obesity and calorie intake amount were greater in spicy taste group than ordinary or not-spicy taste group.

**Conclusion:** This study shows that dietary patterns with spicy or salty taste-preference and good appetite are associated with high obesity index. Especially in men, WC, BMI and prevalence of obesity were greater in those with spicy or salty taste-preference as well as with good appetite compared to ordinary group.

## T5:PS.42

**Determinants of 10-year olds' attitudes toward obesity. A nationwide population-based study.**Hansson, LM<sup>1</sup>, Tynelius, P<sup>1</sup>, Rasmussen, F<sup>1</sup>.<sup>1</sup>Department of Public Health Sciences, Karolinska Institutet, Sweden.

**Background and aims:** Limited work has been conducted to elucidate how stereotypes about obesity are transmitted to children. Parents are role-models and are considered an important source for learning socio-cultural values. The aim of this study was to examine familial and individual characteristics associated with attitudes toward obesity among 10-year olds.

**Methods:** This study was based on a Swedish nationally representative sample of children born in 1995 randomly selected in 2005. A questionnaire was sent out collecting data on children's height, weight, body-esteem and attitudes toward silhouettes depicting an obese, a thin and an average weight boy and girl. Parents reported their own body size, belief of controllability of obesity and socio-demographics. The analysis sample comprised 1384 individuals.

**Results:** A multiple linear regression analysis, adjusted for parental education, place of residence as well as parental gender, revealed that children's body-esteem ( $B=0.4-0.5$   $p<0.05$ ), parental body size ( $B=0.2$   $p<0.05$ ) and designation of controllability of obesity among parents ( $B=0.3-0.5$   $p<0.05$ ) were associated with attitudes toward an obese boy or girl. Children's own BMI did not moderate the associations.

**Conclusions:** Our results suggest that children's negative attitudes toward obesity might develop from children's own body concerns and parents' view that obesity is caused by an individual's inability to control his or her weight. The public health implication is to emphasize the need to communicate to parents, children as well as other influencing sources, the complexity of the determinants of childhood obesity. Additionally, an acceptance of diversity in weight needs to be stressed.

**Funding:** Research relating to this abstract was funded by The Swedish Foundation for Health Care Sciences and Allergy Research (The Vårdal Foundation), Stockholm, Sweden.

## T5:PS.44

**Breaking the paradigm: Despite relationship between obesity and gastroesophageal reflux symptoms, subjects with the highest BMI have lower symptom intensity.**Lopez, JC<sup>1,2</sup>, Lopez, L<sup>3</sup>, Higgings, P<sup>1</sup>, Comuzzie, A<sup>1</sup>, Gonzalez, J<sup>4</sup>, Crespo, Y<sup>4</sup>, Vargas, JA<sup>1</sup><sup>1</sup> Department of Genetics. Southwest Foundation for Biomedical Research. San Antonio, Texas.<sup>2</sup> Hospital Regional de Veracruz, S.S. Mexico; <sup>3</sup> Universidad de Guanajuato, Mexico; <sup>4</sup> Nycomed S.A. de C.V.

Several studies have demonstrated an association between high body mass index (BMI) and symptoms of gastroesophageal reflux disease (GERD), these findings are not consistent across all studies. Our aim was to determine the relation between BMI and grade of esophageal damage in patients with GERD symptoms.

We studied 917 subjects (53.76% females), aged  $37\pm 7$  y.o., with endoscopy procedure. BMI in males was higher than females ( $26.8\pm 3.5$  vs.  $25.2\pm 4.5$ ,  $p<0.001$ ). All subjects had a physician interview for evaluation of symptoms associated with GERD (Likert scale). Esophagus distal portion was evaluated endoscopically to determine the presence of mucosal injury according Los Angeles criteria (LA).

Severe esophageal damage (C-D ulcers) was associated with intensity of heartburn, retching, halitosis, regurgitation, and chest oppression. The grade of esophageal damage was associated with overweight (BMI 25-30 OR=2.8 95%CI: 1.2, 6.7), but not with obesity (BMI >30). A BMI > 30 were associated with a higher score for heartburn and retching, but a lower for nausea.

Using surface response graphics we found that overweight (not obesity) patients with esophageal damage scored C-D had the highest scores for heartburn and retching, adjusted by sex, age, and geographical distribution (using general lineal model). Those with a BMI>30 had lower retching and nausea scores compared with overweight individuals independent of the LA score.

We conclude that obese subjects may have less sensibility to pain, perhaps associated with known changes in nitric oxide or denervation. This finding could explain some inconsistencies in reports of the association between BMI and GERD symptoms.

## T5:PS.45

**The Relationship Between Sleep Duration and Body Mass Index in Norwegian Children (age 10-12)**Danielsen, YS<sup>1</sup>, Pallesen, S<sup>1</sup>, Stormark, KM<sup>2</sup><sup>1</sup>Faculty of Psychology, University of Bergen, Norway; <sup>2</sup>Center for Child and Adolescent Mental Health, Norway

The present study is a part of a large cross-sectional study (The Bergen Child Study). Children and parents of a population of secondary school children in Norway (N=9430) were invited to complete a questionnaire including questions about usual bedtime, wake up time, evaluation of pubertal maturity, parental education and economic status and parent-reported height and weight of the child. A total of 66.4% of parents and children participated. BMI was available for 4161 children.

A one-way ANOVA was conducted to explore the relationship between sleep duration and BMI. BMI was transformed to z-scores for gender and each age group and sleep duration to z-scores for each age group. A U-shaped relationship between self-reported sleep duration and BMI was found. There was no significant relationship between BMI and parent-reported sleep duration.

A hierarchical regression analysis was conducted where self-reported level of pubertal maturation was entered in step1, socioeconomic status in step2 and sleep duration (adjusted for age) in the third and last step. The results showed that the level of pubertal maturation was positively and level of socioeconomic status was negatively associated with body mass index.

Sleep duration was unrelated to BMI in this analysis.

We conclude that higher BMI was associated with shorter and longer self-reported duration of sleep. When controlling for pubertal maturation and socioeconomic status, the relationship between sleep duration and BMI was no longer significant.

## T5:PS.52

**Birth weight and childhood bmi among 191,163 danish schoolchildren and the risk of stroke in adulthood**Baker, JL<sup>1</sup>, Olsen, LW<sup>1</sup>, Truelsen, T<sup>1</sup>, Sørensen, TIA<sup>1</sup><sup>1</sup>Institute of Preventive Medicine, Copenhagen, Denmark

Previously we demonstrated that higher childhood BMI raises the risk of coronary heart disease in adulthood. Although birth weight has been associated with stroke, less is known about how childhood BMI may affect the risk. Therefore we investigated if birth weight and childhood BMI from 7-13 years of age was associated with stroke in adulthood.

The subjects were 97,391 boys and 93,772 girls born from 1936-1976 in the Copenhagen School Health Records Register. BMI values were calculated and transformed to z scores. Stroke events were obtained from Danish Hospital and Cause of Death Registers. Cox regressions were performed.

Among boys, birth weight was associated with stroke in adulthood. Compared to boys in the reference category (3251-3750g) those in the lowest (2000-2750g) had a relative risk (RR) of 1.37 (95% CI: 1.22-1.55) of stroke. BMI at 13y was independently associated with stroke in boys. Birth weight and BMI did not interact on the risk of stroke. In a model adjusted for birth weight, compared to those with a z score in the reference category (-0.25-0.25) boys with a BMI z-score  $\geq 0.75$  had a RR of 1.15 (95% CI: 1.02-1.29). Similar results were observed for girls.

Birth weight and BMI have independent associations with stroke in adulthood. Taken together, these results suggest that some risk for stroke is already present at birth but that childhood BMI matters as well. Unlike birth weight, childhood BMI is amenable to intervention, thus prevention possibilities remain.

**Funding:** NIH NRSA 1F32DK070491 (to JLB) & The Danish National Research Foundation

## Track 5 Poster Presentations

## T5:PS.51

**Measuring appetite and mood in free-living, weight-losing adolescents.**LC Humphrey<sup>1</sup>, D Radley<sup>1</sup>, AJ Hill<sup>2</sup> and PJ Gately<sup>1</sup>.<sup>1</sup>School of Sport, Exercise and Physical Education, Leeds Metropolitan University, Fairfax Hall, Headingley Campus, Leeds, LS6 3QS, UK; <sup>2</sup>Academic Unit of Psychiatry and Behavioural Sciences, Leeds University School of Medicine, UK.

**Objective:** To compare multiple across-the-day ratings of appetite and mood with single end-of-day ratings in free-living overweight and obese children attending a residential weight-loss camp.

**Methodology:** *Participants:* 44 overweight and obese children (BMI 34.3±5.7 kg/m<sup>2</sup>, age 14.5±1.8 years). *Intervention:* An eight-week (max) programme of physical activity, reduced-energy intake and behaviour change education. *Assessments:* Subjects completed the two types of assessment at the beginning and end of their camp stay. Across-the-day ratings were made before and after each meal and at two hours post meal (9 timepoints) using a hand-held electronic rating system. These ratings were averaged to provide a single score for comparison. End-of-day ratings were paper questionnaires.

**Results:** All end-of-day ratings correlated significantly with across-the-day ratings at both pre ( $r=0.32-0.74$ ) and post ( $r=0.31-0.73$ ) camp. However, there were significant differences between measures with across-the-day ratings showing a narrower range of mean values for appetite and mood. Looking at pre-meal ratings, hunger and desire to eat showed a moderate increase across the day and fullness decreased; a pattern which had disappeared by the end of camp.

**Discussion:** These findings show the merits of both assessment approaches in a free-living environment. Across-the-day ratings are relatively labour intensive but provide detailed profiles of appetite/mood that vary meaningfully over the waking hours. End-of-day ratings are simple to administer, describe overviews of appetite/mood that can be collected prospectively, and are as sensitive as averaged across-the-day ratings. Inter-changeable use of these approaches however is not advised given differences in precision at rating scale end-points.

This research is supported by a project grant from GlaxoSmithKline, UK.

## T5:PS.53

**Relationship between obesity and depression measured by the Center for Epidemiologic Studies Depression Scale in Korean working population**?Jung-Jin Cho<sup>1</sup>, Ji-Yong Kim<sup>2</sup>, Young-Ho Choi<sup>3</sup>, Soo-Young Kim<sup>4</sup>, Chang-Ho Choi<sup>5</sup><sup>1</sup> Hallym University Sacred Heart Hospital, Anyang-si, Korea; <sup>2</sup> Dongkook University, Seongnam-si, Korea; <sup>3</sup> Chucheon University Sacred Heart, Chucheon, Korea; <sup>4</sup> Eulji University, Daejeon-si, Korea; <sup>5</sup> Masan Samsung Hospital, Masan, Korea

**Objectives:** This study evaluates the relationships between body weight and depression in an adult Korean working population.

**Methods:** In this cross-sectional study, a total of 8,019 workers (21-60 years of age) from a nationwide sample were recruited. A self-administered questionnaire was used to assess socio-demographics and depressive symptoms measured by the Center for Epidemiologic Studies Depression Scale (CES-D). The primary predictor was body mass index (BMI), treated both continuously and categorically in logistic regression analyses. Covariates included age, income, education and marital status.

**Results:** Among women, increased BMI was significantly protective for the presence of depression measured by CES-D (OR = 0.93 95% CI = 0.89, 0.96). Among men, BMI was not associated with depression (OR=1.00, 95% CI = 0.97, 1.04). Relative to average-weight women, obese women (BMI  $\geq 25$ kg/m<sup>2</sup>) had decreased odds of depression (OR = 0.68, 95% CI = 0.48, 0.95). However under weight women (OR= 1.42 95% CI = 0.83, 2.44) and severe obese (BMI  $\geq 30$ kg/m<sup>2</sup>) women (OR=1.47, 95% CI =0.64, 3.7) had increased odds of depression, but they weren't significant. No differences between average-weight and obese men were demonstrated (OR = 0.98, 95% CI = 0.75, 1.28). Relative to average-weight men, underweight (OR =1.33, 95% CI = 0.88, 2.01) and severe obese men (OR = 1.85, 95% CI = 0.91, 3.71) had increased odds of depression, but they weren't significant.

**Conclusions:** Differences in BMI was associated with current depressive mood in women, which findings are different from western study. Longitudinal studies are needed to differentiate the discrepancy between two societies.

**Funding:** Research relating to this abstract was funded by the Occupational Safety and Health Research Institute (2005).

## T5:PS.54

**The Energy Model: a tool to evaluate energy levels in food products**Dötsch, M.<sup>1</sup>, Roodenburg A.J.C.<sup>1</sup>, Westerbeek A.C.<sup>1</sup>, Mela D.J.<sup>1</sup>, Weststrate, J.A.<sup>1</sup>, Meijer G.W.<sup>1</sup><sup>1</sup>Unilever Food and Health Research Institute, Unilever Research and Development Vlaardingen, Vlaardingen, The Netherlands

The food industry needs objective tools to assess the nutritional quality of products and set targets for improvements. However, existing measures are largely focused on total diets or only locally applicable. We (Nijman et al. EJCN 2007; 61:461-471) have recently developed and published a globally applicable method to evaluate the levels of trans fats, saturated fats, sodium, and sugars across a wide foods and beverages portfolio. Setting energy criteria for specific foods is complex because energy density differs greatly between products, and portion sizes are not internationally harmonized. Nevertheless, we have now developed a methodology to evaluate the energy content of foods, based on published recommendations for energy density, energy requirements and intake patterns. Criteria for meal components and beverages are based on energy density. Ready-to-eat meals and snacks potentially make a large energy contribution to the diet, but products vary considerably in both energy density and portion size. Therefore, criteria for these products are based on total energy content. The energy model has been developed to guide product innovation in order to help reduce the risk of excessive energy intakes.

	Qualifying criteria
<b>Meal components</b>	
• High water content (>50% w/w)	≤1.5 kcal/g OR >1.5 kcal/g AND ≤50% of Market Standard
• Low water content (≤50% w/w)	≤2.5 kcal/g OR >2.5 kcal/g AND ≤50% of Market Standard
<b>Ready-to-eat meals</b>	Adults (children)
• Breakfast	≤360 (280) kcal/serving
• Lunch	≤540 (420) kcal/serving
• Dinner	≤540 (420) kcal/serving
<b>Snacks</b>	≤120 (95) kcal/serving
<b>Beverages</b>	≤0.25 kcal/g excluding calories from protein

## T5:PS.56

**The Prediction for the cut-offs of body mass index, abdominal circumference, and body fat percentage from cardiovascular risk factors in the diagnosis of childhood obesity**Kim, C, M.D.<sup>1</sup>, Park, K, M.D.<sup>1</sup>, Kim, B, M.D.<sup>2</sup>, Ju, N M.D.<sup>2</sup>, Park, Y, M.D.<sup>3</sup><sup>1</sup> Hallym Sacred Heart Hospital, Anyang, Korea; <sup>2</sup> Ajou University Hospital, Suwon, Korea; <sup>3</sup> BeS Clinic, Seoul, Korea

**Aims:** IOTF(International Obesity Taskforce) obesity definition have not had sufficient evidences in predicting cardiovascular consequences. Recent suggestion is made to apply ancillary measure in addition to assessment of general fatness. The aim of this study is to determine the cutoffs of body mass index(BMI; in kg/m<sup>3</sup>), waist-circumference(WC), and body fat percentage(%BF) based on cardiovascular risk factors.

**Methods:** The height, weight, WC and %BF was measured manually and by bioelectrical impedance analysis for 449 subjects aged 9 to 11. The cutoffs were determined using receiver operator characteristic (ROC) curve analysis. We estimated age-adjusted odds ratios(ORs) for high blood pressure, high total and LDL cholesterol, high triglyceride, low HDL cholesterol and having more than 2 risk factors.

**Results:** ROC curve analysis indicated that all the cutoffs were from 60 to 80 percentile of the subjects. The ORs for having more than 2 risk factors increased abruptly for BMI, WC, %BF of 22.8, 76cm, 36.1% in boys and 21.7, 70.3cm, 34.5% in girls, respectively in the 80th percentile of the subjects. The each cutoff of BMI and WC is approximately 90th percentile of the BMI for age updated nationally in 2007.

**Conclusions:** Cardiovascular risk factors prevalences increased greatly with the BMI for age at the level above 90th percentile and the insulin resistance can be predicted well with the WC for age at the level above 90th percentile as ancillary measure. Therefore the screening and early prevention should be emphasized for children with BMI at the lower level than the definition currently used.

## T5:PS.55

**Weight change over 10 years among a population based cohort of older Australians**Flood VM<sup>1,2</sup>, McGregor KA<sup>1</sup>, Burlutsky G<sup>1</sup>, Gill T<sup>2</sup>, Mitchell P<sup>1</sup><sup>1</sup> Department of Ophthalmology, University of Sydney, Centre for Vision Research, Westmead Millennium Institute, Westmead Hospital, NSW, Australia<sup>2</sup>NSW Centre for Public Health Nutrition, Human Nutrition Unit, University of Sydney, NSW, Australia

**Background:** Although there are data on the increasing prevalence of overweight and obesity in relation to the general adult population, there have been few longitudinal studies tracking weight change among the older population.

**Objective:** To describe weight change over a ten-year period among a population based cohort of older Australians.

**Methods:** A cohort study of people aged 49 years and over at baseline (82% of those eligible) living in two postcode areas west of Sydney. In 1992-94, 3654 people were examined; 2334 people were re-examined five years later and 1952 people 10 years later (75% survivors). Over the ten years of follow-up 1113 people provided measured weight and height data at all three collection periods, with mean age of 62 years at baseline.

**Results:** At baseline, 57.9% of these 1113 participants were overweight or obese (BMI ≥25); 0.8% were underweight (BMI<18.5). Ten years later, 65.9% were overweight or obese, and 1.2% were underweight. The incidence of weight gain in this population was higher than weight loss at both 5 year and 10 year follow up, with over 50% of participants gaining greater than 2 kg.

**Conclusions:** It has generally been thought that weight loss is more of a concern than weight gain among older people, however this longitudinal study indicates that weight gain is more likely to be occurring. With a large aging population, continued weight gain further increases the burden of chronic disease. These data have implications to support policy and interventions which prevent weight gain among older people.

**Funding:** Research relating to this abstract was funded by Australian National Health and Medical Research Council and Meat and Livestock Australia.

## T5:PS.57

**The weight of opinion: perceptions about childhood obesity**Pagnini, D<sup>1</sup>, King, L<sup>1</sup>, Booth, M<sup>2</sup>, Wilkenfeld, R<sup>1</sup>, Booth, S<sup>3</sup><sup>1</sup>NSW Centre for Overweight and Obesity, University of Sydney, Sydney, Australia<sup>2</sup>School of Public Health, University of Sydney, Sydney, Australia<sup>3</sup>NSW Centre for Public Health Nutrition, University of Sydney, Sydney, Australia

**Introduction:** The Weight of Opinion study (WOO) was conducted to investigate the perceptions of community members and professionals regarding childhood overweight and obesity.

**Methods:** WOO was conducted as a series of separate sub-studies comprising focus groups or interviews with parents, school students, school teachers, early childhood staff and doctors. Participants were recruited through schools, childcare centres and General Practice Divisions in 4 different socioeconomic locations across the state of New South Wales, Australia. Discussions covered participants' understandings about childhood obesity, how they responded in professional or community roles, and views on how other groups should respond.

In total, 26 focus groups and 17 individual interviews were conducted. While each sub-study generated specific themes regarding the target groups' perceptions, many themes spanned different groups.

**Results:** Parents, students and professional groups were all aware that childhood obesity was a problem which resulted from a complex set of causes. Participants from all groups acknowledged that parents play a pivotal role, but require support, particularly when children are younger. Parents, students and teachers interpreted weight as one aspect of overall health and expressed concern that the focus on obesity might promote eating disorders. Weight was seen as an awkward topic to talk about. Weight and food were emotional issues, which contrasted to perceptions about activity.

**Conclusions:** Social norms that link weight with people's identity and appearance are reflected in perceptions about childhood obesity. These issues must be considered in the design of communications and programs, if they are to be effective.

**Funding:** The NSW Centre for Overweight and Obesity received funds from the NSW Department of Health and The Ross Family Trust for this work.

## T5:PS.58

**Parental Body Mass Index in association with the prevalence of overweight/obesity among adolescents in Greece; dietary and lifestyle habits in the context of the family environment (the Vyronas Study)**

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The objective of this study was to evaluate whether parental Body Mass Index is associated with overweight/obesity in a sample of Greek adolescents, taking also into consideration, dietary habits and lifestyle characteristics in the context of the family environment. The Vyronas study is a cross-sectional health and nutrition survey. During 2004/2005, a sample of 2008 schoolchildren was selected. BMI was calculated and a semi-quantitative Food Frequency Questionnaire was applied. Multiple logistic regression and discriminant analysis were used. Results demonstrated that there is a strong positive association between the parental overweight/obesity status with their children. Discriminant analysis showed that the frequency of breakfast consumption and the consumption of diet drinks are the factors that better distinguished overweight/obesity of both sexes in relation to parental obesity. Furthermore, the frequency of the consumption of pulses was the factor that better distinguished overweight/obesity of girls, while the time devoted to sports activities was the factor that better distinguished overweight/obesity of boys in relation to parental obesity. In conclusion our findings illustrate that eating and lifestyle behaviours are probably influenced differently for boys and girls within the family environment demonstrating the need for sex-specific interventions in order to promote healthy eating and physical activity behaviours during adolescence. **Key words:** parental BMI; adolescents; dietary habits; physical activity; obesity; overweight; family environment

## T5:PS.60

**Are eating behaviours associated with childhood overweight? Results from a French national survey.**

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**Background:** The overall rapid increase in childhood overweight (OW) rates in the last three decades primarily involves environmental and behavioural factors. Nevertheless, several questions remain concerning the role of dietary factors.

**Objective:** To assess the relationships between childhood OW and two eating behaviours: 1) the number of eating episodes, and 2) the relative contribution of breakfast, main meals (lunch and dinner) and snacks to total daily energy intake (EI).

**Design and subjects:** Representative sample of French children aged 3-11 y ( $n=748$ ) taken from the 1998-99 cross-sectional French INCA-1 food consumption survey.

**Measurements:** Food consumption was collected using a 7-day food record, and socio-economic status (SES), physical activity, weight and height were reported by answering face-to-face questionnaires. OW was defined according to the IOTF definition.

**Results:** OW was 1) inversely correlated to the number of eating episodes (multivariate OR for tertile 3 versus 1 ( $OR_{31}$ ) = 0.48 [0.29-0.80],  $P$  for trend = 0.0054); 2) positively associated with the contribution of main meals to EI ( $OR_{31}$  = 1.91, [1.18-3.09],  $P$  for trend = 0.0068); 3) inversely correlated to the contribution of snacking episodes to EI ( $OR_{31}$  = 0.43, [0.26-0.72],  $P$  for trend = 0.0011); and 4) not significantly associated with the contribution of breakfast to EI. Multivariate analyses were adjusted for EI, physical activity, and SES.

**Conclusion:** Combining more frequent intake occasions with a lower contribution of the main meals to total daily EI is associated with a smaller risk of OW in children.

**Key words:** Child obesity / intake occasions / energy intake

## T5:PS.59

**A comparison of the prevalence of obesity from a telephone survey and health examination from a representative population study in the Reykjavik area.**

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**Objective:** Two representative population studies, both including information on height and weight were conducted in the Reykjavik area in the years 2001-2003. One was a telephone survey and the other a health examination. The objective of this study is to compare the prevalence of obesity in the two studies in order to see if and to what extent telephone surveys may underestimate obesity compared to health surveys.

**Material and Methods:** The National Nutrition Survey was carried out in the year 2002. A random sample of 2000 people was drawn from the national population register. Information was gathered through telephone interviews and the participation rate was 70.6%. The health survey was done in the Reykjavik area in the years 2001-2003. Of 2310 who were invited, 1630 subjects participated in a comprehensive physical examination (70.6%). We compared the prevalence of obesity ( $BMI \geq 30$ ) for different age groups among men and women in the two studies.

**Results:** The prevalence of obesity among men was 11.0% in the telephone survey, but 17.1% in the health examination. For women the prevalence was 10.8% and 22.7% respectively,  $p < 0.0001$  for both sexes. The difference seems to be greatest among younger women.

**Conclusions:** An important underreporting of obesity may be expected when depending only on epidemiological information from telephone interviewing. As telephone or postal surveys are relatively easy to conduct and will be used to monitor obesity prevalence, it is important to be able to make a correction for eventual underestimation.

## T5:PS.61

**Obesity markers and estimated 10 year fatal cardiovascular risk in Switzerland**

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**Objective:** To assess the effectiveness of obesity markers to detect high (>5%) 10-year risk of fatal cardiovascular disease (CVD) as estimated using the SCORE function.

**Methods:** Cross-sectional study including 3,047 women and 2,689 men aged 35-75 years (CoLaus study). Body fat percentage was assessed by tetrapolar bioimpedance. CVD risk was assessed using the SCORE risk function and gender and age-specific cut points for body fat were derived. The diagnostic accuracy of each obesity marker was evaluated through receiver operating characteristics (ROC) analysis.

**Results:** Body fat presented a higher correlation with 10-year CVD risk than waist/hip ratio (WHR), waist or BMI: in men,  $r=0.31, 0.22, 0.19$  and  $0.12$  and for body fat, WHR, waist and BMI, respectively; the corresponding values in women were  $0.18, 0.15, 0.11$  and  $0.05$ , respectively (all  $p < 0.05$ ). In both genders, body fat showed the highest area under the ROC curve (AUC): in men, the AUC (and 95% confidence interval) were  $76.0 (73.8 - 78.2)$ ,  $67.3 (64.6 - 69.9)$ ,  $65.8 (63.1 - 68.5)$  and  $60.6 (57.9 - 63.5)$  for body fat, WHR, waist and BMI, respectively. In women, the corresponding values were  $72.3 (69.2 - 75.3)$ ,  $66.6 (63.1 - 70.2)$ ,  $64.1 (60.6 - 67.6)$  and  $58.8 (55.2 - 62.4)$ . The use of body fat percentage criterion enabled to capture three times more subjects with high CVD risk than BMI criterion, and almost twice as much as WHR criterion.

**Conclusions:** Obesity defined by body fat percentage is more accurate to detect high 10-year risk of fatal CVD than obesity markers based on WHR, waist or BMI.

Abstracts

T5:PS.62

**Obesity, Insulin Resistance, metabolic syndrome and iron status in prepubertal children. The PROGRESS study.**

Moschonis, G, Grammatikaki, E, Argyropoulou, D, Kyriakou, K, Dede V, Farmaki, A, Fotopoulou, T, Micheli, S, Gakni, D, Lidoriki, S, Manios, Y.

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**Introduction:** Recent literature indicates that obesity is associated with hypoferrremia (low serum iron). The aim of the present study was to examine the relationships between obesity, insulin resistance (IR) and metabolic syndrome (MS) with serum iron, dietary iron intake and iron stores in prepubertal children.

**Materials and methods:** We examined a representative sample of 870 primary schoolchildren aged 9-13 years old participating in the "Prediabetes, Obesity and Growth Epidemiological Study in Schoolchildren" (The PROGRESS study). The collected data included anthropometric (weight, height, waist circumference), biochemical (fasting plasma glucose and serum insulin, iron and ferritin levels) and dietary indices. The IOTF references were used for the definition of overweight and obesity. Insulin and glucose were used to estimate IR (HOMA-IR). MS was diagnosed using the new International Diabetes Foundation definition.

**Results:** Obese subjects were found to have significantly higher levels of serum ferritin than non-obese ones ( $p=0.003$ ). Similarly significantly higher levels of serum ferritin were observed for subjects with central obesity (ie, waist circumference  $>90^{\text{th}}$  age and sex-specific percentile) ( $p=0.001$ ) and MS ( $p<0.001$ ) compared to their healthy counterparts. Furthermore, subjects with IR were found to have significantly lower levels of serum iron levels ( $p=0.031$ ) and of dietary iron intake compared to healthy subjects.

**Conclusion:** In prepubertal children IR was associated with hypoferrremia, which is probably explained by decreased dietary iron intake. Furthermore, obesity, central adiposity and MS were associated with higher levels of iron stores (serum ferritin), probably explained by the low-grade inflammation induced in these metabolic conditions

**Conflict of Interest:** Yannis Manios also works as a part-time scientific consultant for Friesland Foods Hellas. None of the other authors had any potential conflict of interest.

**Funding:** Research relating to this abstract was funded by Friesland Foods Hellas.

T5:PS.64

**Underweight, Overweight and Obesity in Young Adulthood associated with Increased Risk of Future Disability Pension**

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**Background:** Obesity and underweight in young adulthood are associated with greater risk of future disability pension, but the specific causes driving these risks is not well established. The risk associated with overweight at this age has not been established either.

**Objective:** To investigate the risk of future disability pension from all and specific causes according to BMI in young adulthood.

**Methods:** Height and weight were measured at military conscription between 1969 and 2005 (n=1 580 460; 18.3±0.4y). Date and cause of disability pension (ICD 8/9/10), death and emigration dates were collected from national registers between 1971 and 2006. Data on municipality, socio-economic position, testing centre, and test year were adjusted for in Cox proportional hazard models.

**Results:** During 30 820 283 person-years of follow-up, 62 775 subjects were granted disability pension. The total number, and associated hazard ratios (with 95% confidence intervals), are shown in the Table according to BMI.

BMI	All	Circulatory	Cause Musculo Skeletal	Psychiatric	Injuries
<18.5	1.29 (1.26-1.32)	1.07 (0.93-1.22)	0.98 (0.92-1.03)	1.53 (1.48-1.58)	1.03 (0.94-1.13)
18.5-24.9			Reference		
25-29.9	1.27 (1.23-1.30)	1.95 (1.72-2.20)	1.53 (1.45-1.61)	1.07 (1.02-1.11)	1.20 (1.10-1.31)
>=30	1.89 (1.80-1.98)	3.45 (2.76-4.30)	2.24 (2.03-2.48)	1.43 (1.32-1.55)	1.64 (1.39-1.95)
Cases	62 775	2 424	14 783	29 445	5 556

**Conclusion:** The risks in the overweight and obese were elevated for each cause, while in the underweight increased risk was seen only for psychiatric causes. Although causality cannot be inferred, productivity costs associated with adverse BMI in young adulthood appear to be large.

T5:PS.63

**Underweight, Overweight and Obesity in Young Adulthood associated with Increased Risk of Death**

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**Background:** The relationship between BMI and mortality is still debated. Recent data suggest risk for non-cancer and non-CVD death to be lower in overweight subjects.

**Objective:** To investigate the risk of death from all and specific causes according to BMI status in young adulthood.

**Methods:** Height and weight were measured at military conscription between 1969 and 1983 (n=693 381; 18.3±0.4y). Date and cause of death and emigration were collected from national registries between 1969 and 2007-09. Data on muscle strength, municipality, socio-economic position, testing centre, and test year were adjusted for in Cox proportional hazard models.

**Results:** The mortality risks among overweight and obese were significantly elevated for all causes, CVD, cancer, injuries and other causes (Table). In the underweight, the pattern was different.

BMI	Hazard Ratio (95%CI)					
	All causes	All causes excluding injuries	CVD	Cancer	Injuries	Other causes
<18.5	1.11 (1.07-1.16)	1.10 (1.04-1.16)	1.03 (0.91-1.17)	1.10 (0.97-1.24)	1.13 (1.07-1.20)	1.12 (1.04-1.20)
18.5-24.9			Reference			
25-29.9	1.20 (1.15-1.26)	1.28 (1.20-1.36)	1.68 (1.48-1.90)	1.28 (1.11-1.47)	1.10 (1.02-1.19)	1.11 (1.02-1.21)
>=30	1.92 (1.75-2.10)	2.27 (2.04-2.54)	3.59 (2.96-4.35)	1.36 (1.00-1.86)	1.40 (1.19-1.64)	1.94 (1.67-2.26)
N	690 175	679 394	690 175	690 175	690 175	690 175
Deaths	23 668	12 887	2 734	2 683	10 781	7 470

**Conclusion:** In this age-group, the risk of non-cancer/non-CVD/non-injury death in the overweight was significantly elevated, although of smaller magnitude than for cancer and CVD. The risk of death from injuries was also elevated for underweight, overweight and obese.

T5:PS.65

**Body shape and body weight perception among two non-western migrant origin groups living in the Netherlands**

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**Objective:** To evaluate the perception of body shape and body weight and their relationship with actual body weight in two non-western migrant origin groups, Turks and Moroccans. The association with acculturation was also studied.

**Methods:** Cross-sectional study, Amsterdam, the Netherlands. Males and females (18-30yrs) randomly selected from the population registry (n=451). Participants, or at least one of their parents, were born in Turkey or Morocco. Perception of body shape was assessed using silhouette drawings and individuals were asked to describe their weight. Acculturation variables were generation status, cultural orientation and social contacts.

**Results:** Participants had a thin ideal body shape. The discrepancy between ideal and current shape was significant in women but not men ( $p<0.0001$ ). Perceived current body shape was correlated with BMI (Spearman's correlation coefficient 0.60,  $p<0.001$  (men) and 0.733,  $p<0.001$  (women)). Nevertheless, among overweight participants (BMI 25-29.9 kg/m<sup>2</sup>), 70% of men and 35% of women described themselves as "average". Paying attention to body weight was associated with a discrepancy between ideal and current shape amongst women and with describing oneself as "overweight" amongst men. Ideal body shape was not associated with any of the three acculturation variables.

**Conclusion:** As is typical of many western populations, in these non-western origin groups the majority of women wish to be thinner than they are whereas most men do not seem to recognize their overweight. Raising awareness of weight status appears to be an important intervention goal although caution is advised when targeting women.

**Funding:** Research relating to this abstract was funded by the Netherlands Heart Foundation and the Netherlands Organisation for Scientific Research (NWO, ZonMw).

## T5:PS.66

**The prevalence of overweight and obesity in 7-9 year old children in France is stable between 2000 and 2007**Péneau, S<sup>1</sup>, Salanave, B<sup>2</sup>, Rolland-Cachera, MF<sup>1,2</sup>, Castetbon, K<sup>2</sup>, Hercberg, S<sup>1,2</sup><sup>1</sup>INSERM, U557, Bobigny, France; INRA, U1125, Bobigny, France; CNAM, EA3200, Bobigny, France; Univ Paris13, Bobigny, France; CRNH IdF, Unité de Recherche en Epidémiologie Nutritionnelle, Bobigny, France<sup>2</sup>InVS, Bobigny, France; CNAM, Bobigny, France; Univ Paris13, Bobigny, France; CRNH IdF, Unité de Surveillance et d'Epidémiologie Nutritionnelle, Bobigny, France**Introduction:** The prevalence of childhood overweight and obesity has increased worldwide. In France, the National Nutrition and Health Program implemented in 2001 aimed to stop this trend. We assessed the changes in the prevalence of overweight and obesity in 7-9y old children between 2000 and 2007.**Methods:** The protocol was based on the European Childhood Obesity Group recommendations (Lehingue, Am J Clin Nutr, 1999). One primary school was randomly selected in each voluntary department of France, in which two randomly selected classes were included. Weight and height were measured by the medical staff. A lifestyle questionnaire was completed by the parents. IOTF cut-offs were used to define body-mass status.**Results:** Sixty-seven percent of the French departments participated. In 2007, 19.7% of the 2,525 children included were overweight (boys: 18.3%, girls: 21.1%), among whom 4.8% were obese (boys and girls: 4.8%). Prevalence of overweight was lower in children with executive mothers (8.8%) or fathers (9.3%). Overweight children spent more time in front of a TV or a computer (2h30) than non-overweight children (2h07). In the departments investigated in both 2000 (n=1,582 children) and 2007 (n=1,014) the prevalence of overweight was 18.1% including 3.8% obese in 2000 and 18.1% including 4.0% obese in 2007.**Conclusion:** This study gives up-to-date prevalence of overweight and obesity in 7-9y children in France. After increasing prevalence during recent decades, the observed stabilisation is encouraging. Factors contributing to this levelling-off must be investigated. An impact of the French National Nutrition and Health Program can be hypothesised.

## T5:PS.68

**EPODE: a childhood obesity prevention program where social marketing methods are fundamental**

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The EPODE Program, developed in France since 2004, is inspired by the experience developed in previous community and school-based interventions. The objective is to curb the progression of childhood obesity through a methodology that establishes prevention at the heart of the city networks, using social marketing to mobilize local stakeholders and empower families and individuals in a sustainable way.

The model, now extending to over 2 million inhabitants in 127 French cities, 5 Spanish and 2 Belgian, consists of the strategic coordination at a national and local level of concrete initiatives fostering pleasant and balanced eating habits and greater physical activity in everyday life.

These actions are delivered under the conductance of a national coordination team using social marketing methods to coach and accompany a local project manager nominated by the mayor. This coordination implicates network organization techniques, continuous education, approaches relying on group dynamics and social policies modification, marketing towards health professionals, general public communication and press relations serving public health issues.

Through the local team, this coordination enables to implicate the entire community (teachers, school catering, health professionals, parents, media...) to become a vector within an obesity prevention strategy creating an environment that facilitates changes close to the family.

Success to date is measured by a large field mobilization in the French pilot cities and by the encouraging evolution of the BMI of children. We will present the latest measurements concerning field mobilization in the French pilot cities and the encouraging evolution of the BMI of children.

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## T5:PS.67

**Fat Mass Index and Fat Free mass Index Reference Curves for Children Aged 11-14years**Potter J<sup>1</sup> and Hale B<sup>1</sup><sup>1</sup>University of Chichester, Chichester, UK

This paper considers methods available for the measurement of childhood obesity and suggests Fat Mass Index (FMI) as a useful diagnostic and assessment tool. FMI has been in the literature for some years but has not become established. This paper presents percentile curves for FMI and FFMI (Fat Free Mass Index) for 11-14 year olds, from which useful reference values might be established.

1584 Caucasians (938 boys, 646 girls) 11-14 years were measured for height and fat mass by BIA (Tanita BC418 MA). Fat mass and fat free mass indexes were calculated by dividing fat mass (kg) and fat free mass (respectively) by height (m) squared. FMI and FFMI centile curves were generated using the LMS programme (version 2.0). For each 7 centile curves were calculated, from the 2<sup>nd</sup> through to the 98<sup>th</sup> spaced two-thirds of a z-score apart, (z=-2, -1.33, -0.67, 0, +0.67, +1.33, and +2) in the format used in other reference charts. The 85<sup>th</sup> and 95<sup>th</sup> centile were also calculated. These along with the 2<sup>nd</sup> centile were used to generate health ranges for FMI and FFMI.

FMI may be a more appropriate tool for assessing obesity than body size, or more useful than fat percentage as changes in both fat and lean components can be tracked. FMI has similarities to BMI improving understanding by clinicians and patients. However, to make it a useable tool reference values need to be established. This paper provides data that may contribute to the development of reference values across all ages.

**Funding:** This study involves the use of a Tanita BC 418MA. This research group have previously received a grant from Tanita UK, but it was not used to finance this study.

## T5:PS.69

**Accuracy of anthropometric fat location indices as predictors of cardiovascular risk factors in children**Amorim, RA<sup>1,2</sup>, Andersen, LB<sup>3</sup>, Froberg, K<sup>2</sup>, Heitmann, BL<sup>1</sup><sup>1</sup>Research Unit for Dietary Studies. Institute of Preventive Medicine, Copenhagen University Hospital, Copenhagen, Denmark.<sup>2</sup>Institute of Sport Science and Clinical Biomechanics. University of Southern Denmark, Odense, Denmark.<sup>3</sup>Norwegian School of Sport Sciences, Oslo, Norway.**Background:** Most of published cutoffs for body-fat location indices or BMI have been based on population distribution rather than health outcomes**Objective:** To evaluate the ability of anthropometric fat location indices and BMI of predicting clustering risk factors of cardiovascular disease (CVD) in children, in addition to defining their respective cutoffs.**Method:** A cross-sectional analysis of 901 Danish schoolchildren from 3<sup>rd</sup> and 9<sup>th</sup> grade who participated in the European Youth Heart Study was used. Children were considered to have clustering risk factors if, at least three of the following risk factors were present: high levels of total cholesterol, LDL-C, blood pressure or %body-fat. The diagnostic accuracy for detecting clustering risk factors was evaluated through ROC analysis and cutoffs producing equal sensitivity and specificity; minimizing misclassifications and; corresponding to 85<sup>th</sup> percentile of sex-and-age-specific distribution were derived.**Results:** Cutoffs producing equal sensitivity-and-specificity and minimizing misclassifications matched respectively the 75<sup>th</sup> and 95<sup>th</sup> percentiles of sex-and-age-specific distribution and the former produced significantly lower cutoffs than the latter. Specificity was markedly higher than sensitivity for all anthropometric indices and increased within cutoffs (75<sup>th</sup>; 85<sup>th</sup>; 95<sup>th</sup> percentiles). BMI and all fat location indices were significantly better than chance as diagnostic test for CVD, except waist-to-hip ratio. BMI performed better than waist-and hip circumferences (AUC 0.81 vs. 0.75; 0.72 *p-value*<0.001) however, the significant differences disappeared when BMI was compared to their height-adjusted peers (AUC 0.81 vs. 0.82; 0.82 *p-value*>0.05).**Conclusion:** BMI and waist-and hip-to-height ratio can be used to identify children with clustering risk factors for CVD.

## T5:PS.70

**Statistical design and analysis of satiety trials comparing foods and food ingredients**

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Scientific and commercial interest in comparing satiety profiles of foods and ingredients is increasing. However, inconsistent and inappropriate statistical approaches can obscure correct interpretation of results. Several issues are particularly relevant. 1) Balancing treatment order to correct for carry-over effects: A Latin Square (where possible a 'Williams' design) should be used for cross-over trials. 2) Baseline correction: In randomized designs, baseline differences are a random effect. Even if differences are small, correction by the simple subtraction ('change from baseline') introduces artifactual differences (thus potentially artifactual significance) and also inflates variance (potential loss of power). This furthermore carries an implicit, rather improbable, assumption that the baseline differences have a fixed impact at all subsequent measurement points. As with other short- and long-term randomized clinical trial designs, use of baselines as covariates as standard practice is strongly recommended, regardless of the size (or significance) of baseline differences. 3) Measurement of duration of response: Most satiety studies focus on area under the curve, which cannot distinguish differences in response profile or duration. The interpolation approach commonly used to estimate time to return to baseline (TTRTB) is not always possible, and produces only a mean with no variance estimate. We have compared several alternative approaches to define a method that allows for quantitative estimate and comparison of TTRTB amongst different foods. The Weibull distribution provided the best fit to data and ability to determine mean response time and 95% interval. Examples of these issues will be presented, with recommendations for best practice.

## T5:PS.72

**Sugar sweetened beverages and overweight in a sample of schoolchildren.**

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**Objectives:** To assess the association between sugar sweetened beverages (SSB) consumption and overweight in a sample of Portuguese schoolchildren.

**Material & Methods:** We have enrolled 1675 Portuguese schoolchildren, aged between 5-10 years. After parental written consent, dietary habits were recorded using a semiquantitative food frequency questionnaire. Height and weight were measured according to international standards, and body mass index (BMI) was calculated. The definition of overweight was based on average centiles according to the International Obesity Task Force cut-offs. To determine the magnitude of the association between SSB consumption and overweight, odds ratios estimates including confidence intervals, were computed using unconditional logistic regression, adjusting for confounders (energy intake, TV watching, questionnaire respondent, and parental education).

**Results:** Prevalence of overweight (including obesity) was 38.6% for girls, and 40.3% for boys. Regarding SSB consumption (serving size/day), no differences between overweight and non overweight children were found. After statistical adjustment for confounders we found that a consumption of more than 3 serving sizes of SSB per day was positively associated with overweight in girls (OR = 2.65, 95% IC: 1.15-6.14) and boys (OR = 2.29, 95% IC: 1.06-4.97), compared to a consumption of less than 3 serving sizes/day.

**Conclusion:** The intake of SSB for more than 3 serving sizes/day was associated with increased risk of overweight in schoolchildren from both genders.

## T5:PS.71

**TV viewing, physical activity, soft-drink consumption and overweight/obesity of adolescents in Ho Chi Minh City, Vietnam<sup>1</sup>**

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**Objective:** To examine influences of TV viewing, physical activity, soft-drink consumption on overweight/obesity of adolescents in Ho Chi Minh City (HCMC), Vietnam.

**Methods:** A prospective cohort study was conducted among 785 junior high school students over a 2-year period. Data were collected at baseline in 2004 and 12, 24 months later including anthropometry, parental factors, child's dietary behaviours, sedentary and physical activities using questionnaires and accelerometers. Body mass index (BMI) was assessed and overweight/obesity was defined using IOTF cut-offs. Soft-drink consumption was classified as frequently; not frequently or rarely/don't consume. TV viewing was divided into three levels: <2 hours, 2-3 hours, and >3 hours. Longitudinal Poisson regression analyses were applied to assess associations between dietary and physical/sedentary behaviours and adolescent overweight/obesity.

**Result:** After adjustment for demographics, family/parental factors, the risk of overweight/obesity was 2.5 times higher in children spending >3 hours/day watching TV (RR = 2.5, 95% CI = 1.8, 3.4) compared to <2 hours, and was 30% lower in children having ≥20 minutes/day for vigorous activities (RR = 0.7, 95%CI = 0.6, 0.9) compared to <20 minutes. Frequently consuming sweetened soft-drink increases the risk of overweight/obesity three times (RR = 3.0, 95%CI = 1.9, 4.7) compared to those with the lowest frequency of consumption of soft drinks.

**Conclusion:** Consumption of soft-drink, physical activity and TV viewing are related to overweight/obesity in adolescents in HCMC. Intervention strategies to promote physical activity and reduce TV viewing as well as soft-drink consumption are needed to prevent overweight/obesity among adolescents in HCMC.

<sup>1</sup> Research relating to this abstract was funded by Health Department of Ho Chi Minh City and Nestle Foundation.

## T5:PS.73

**The role of metabolic syndrome duration in predicting poor health related quality of life (HRQOL) in Iranian adults: Tehran Lipid and Glucose Study (TLGS)**

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**Objective:** To examine the relation between metabolic syndrome (Met.S) duration and HRQOL in Iranian adults.

**Methods:** In this population based cohort study of TLGS, a representative sample of 644 non diabetic adults (211 men, 433 women), aged ≥20 year, participating in phase III, were selected. The first phase of the TLGS began in 1997. The participants were categorized in three groups, those without and with Met.S in all three phases (group 1 and 3 respectively) and those with Met.S in one or two of phases (group 2). HRQOL were assessed using the Iranian version of SF-36. A score lower than the sex-specific 10<sup>th</sup> percentile of each scale defined as poor HRQOL. Met.S was assessed using ATP III definition. ANCOVA and logistic regression were used in men and women separately and adjusted for related confounders.

**Results:** Mean age of participants was 49.1±14.0 years, and 67.2% were female. Compared to the first, women placed in the second and third groups had lower scores of Physical component scale (74.1±2.3 vs. 70.0±2.5, 66.3±2.4 p<0.01). In women, there was a significant reducing trend in the scores of bodily pain, general and mental health across the three groups respectively (p<0.05). Among men, however, no significant difference was observed in any of the HRQOL domains in the study groups. In women, the odds ratios of poor physical and mental HRQOL were 1.00(reference), 1.57(0.5-4.8), 4.3(1.5-12.5), (p for trend =0.03) and 1.00(reference), 1.1(0.4-3.0), 3.2(1.3-8.3), (p for trend =0.01) respectively.

**Conclusion:** The duration of Met.S is associated with poor HRQOL in women, not in men and mainly in physical rather than mental health.

## T5:PS.74

**Fastfood consumption, television/video viewing, and obesity risks among young Emirati women**

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**Background:** Obesity rates among Emiratis have risen sharply over past decades with subsequent adverse health ramifications. Among possible contributors to these trends are lifestyle changes (e.g., eating away from home, passive TV/video entertainment). This paper aims to delineate potential connections among TV/video viewing, fastfood consumption, and BMI rates of young Emirati women.

**Methods:** A stratified random sample of 125 high-school and 125 college female students completed a short version of the *Youth Healthy Living Survey*. Data were collected on sociodemographics, fastfood and fruit/vegetable consumption, TV/video exposure, type of programs viewed, physical activity, and psychosocial and spatial variables. Weight and height were used to compute BMI.

**Results:** In the midst of a health transition with alarming NR-CD rates, this exploratory study constitutes the first in the Middle East to investigate relationships between consumption of fastfood, passive leisure, and obesity. While data collection is ongoing (anticipated to finish in 1/2008), partial data analysis indicates that: (a) eating has become more appealing while physical activity less so due to more fastfood availability and TV viewing; (b) links between amount/type of TV exposure and higher consumption of unhealthful foods are growing; and (c) both are leading to elevated obesity risks.

**Conclusions:** Consumption of fastfood and TV/video viewing among young women in the UAE seems to have adverse effects on dietary quality in ways that plausibly could increase obesity risks. Findings would significantly help in the planning and implementation of health education and promotion programs.

## T5:PS.76

**MC4r mutations in a sample of morbid obese portuguese patients**

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Obesity is a chronic multifactorial disease with genetic, metabolic, behavioural, psychological and social components. The Portuguese population obesity prevalence is approximately 14%. Mutations in the gene encoding the melanocortin 4 receptor (MC4R), present in 2-6% of patients with morbid obesity (MO), represent the most common monogenic cause of obesity.

**Objective:** To evaluate the MC4R gene mutations prevalence in MO patients and its correlation with Binge Eating Disorders (BED).

**Subjects and Methods:** 102 patients (88 females) with MO were screened for mutations in MC4R gene by direct sequence analysis and females evaluated for the prevalence of BED.

**Results:** Five missense mutations in heterozygosity were detected in the MC4R coding region (c.307G>A, c.751A>C, c.811T>C, c.869T>A and c.1056C>T), each with an allele frequency of 0.49%. A mutation in the 5' untranslated region (c.-178A>C) was detected in 4 cases, one in homozygosity and 3 in heterozygosity (allele frequency: 2.45%). The substitution c.-178A>C, as well as the missense mutations c.307G>A (p.Val103Ile) and c.751A>C (p.Leu251Ile), are probably not associated with obesity related-phenotypes since its prevalence is similar in obese and control populations. The three other detected missense mutations, c.811T>C (p.Cys271Arg), c.869T>A (p.Leu290Gln) and c.1056C>T (3'-untranslated region) were not yet reported. Twenty females (22.7%) presented BED. These were younger (36±10y) than the patients without BED (42±11y; p=0.02).

**Conclusions:** Three polymorphisms at a frequency of 5.9%, and three non-described mutations with a frequency of 0.98% each were detected in our study. These values are in keeping with previous reports. No correlation of presence of MC4R mutations with BED was observed.

Research Grant of the Portuguese Society of Endocrinology, Diabetes and Metabolism and of the Comissão de Fomento da Investigação em Cuidados de Saúde da Saúde, Ministério da Saúde PI Projecto 56/2007

## T5:PS.75

**Obesity prevention in childhood: first results of EPODE program**

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The EPODE Program (E.), developed in several European countries since 2004, is a community based intervention methodology to prevent childhood obesity involving local stakeholders in a sustainable way.

E is a long-term program that lies within the frame of real daily life and takes the environment and constraints into account. It is a positive, concrete and step-by-step apprenticeship of nutritional balance and physical activity. E is a behavior-centered approach, with an educational philosophy prompting fun and non-stigmatization of any food.

A national coordination team using social marketing and organizational techniques coaches the local project managers and the local teams to mobilize local stakeholders like teachers, health professionals, shop keepers, local producers, caterings, media ... to relay healthier lifestyle habits. Dedicated tools and roadmaps are delivered for each profession.

The 5 key factors of E to sustainably mobilize local stakeholders are a strong political will, a scientific background, a professional organization scheme, an ethical public/private involvement and a continuous communication.

Today 127 towns in France, 2 in Belgium and 5 in Spain, concerning more than 2 million people are involved. We will present latest data in terms of management, field mobilization and discuss the evolution of the BMI of 25000 children weighed and measured yearly since 2004 as well as sociological changes.

Grants from: Assureurs Prévention Santé, Nestlé France, Fondation Internationale Carrefour, EPODE Club des Partenaires

## T5:PS.77

**Perception versus Reality for Indices of Health in UK Men.**

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This work intended to look at how men perceive their health in relation to obesity.

This paper presents data collected from 266 men (19-84yrs) who visited MOTO service stations on motorway networks during the summer of 2007. Men were offered 'spare tyre checks' at a health check station making the data unusual in that it provides information from the general population and not those visiting clinicians.

The subjects had a number of health indices measured including; body composition by BIA (Tanita BC-420MA), waist circumference. They were also asked a number of questions regarding their perceptions of themselves in matters of health.

The subjects were found to be significantly ( $t_{(263)} = 25.04, p < 0.001$ ) overweight ( $23.01 \pm 16.82$  kg) and had a mean excess of  $4.95 \pm 16.82$  kg of fat. Paired samples t-tests revealed significant differences between their guessed waist and their real waist measurement ( $t_{(263)} = -18.69, p < 0.001$ ) with the average estimate being  $3.4 \pm 3.7$  inches under. As their waist circumference increased the men regarded their weight to be more important than waist circumference. Subjects were asked to categorise themselves in terms of their body composition. Of those with BMI's  $30-35 \text{ kg/m}^2$  89% underestimated their size, with 60% of those in the morbidly obese category of  $>35 \text{ kg/m}^2$  thinking that they were not obese.

The differences between perception and reality that individuals have is likely to have an impact on the effectiveness of any education and intervention programme as they will deem the information or process the information more or less relevant to themselves.

## T5:PS.78

**Gender differences in associations between home environment and overweight/obesity among adolescents of Ho Chi Minh City, Vietnam**M.J. Dibley<sup>1</sup>, T.K. Hong<sup>2</sup>, D.Sibbritt<sup>3</sup>, N.H.H.D. Trang<sup>2</sup><sup>1</sup>The School of Public Health, and The George Institute for International Health, University of Sydney, Room 307A, Edward Ford Building (A27), The University of Sydney, NSW 2006 Australia;<sup>2</sup>Department of Community Health, University Training Centre for Health Care Professionals (UTC), Ho Chi Minh City, Vietnam<sup>3</sup>Centre for Clinical Epidemiology and Biostatistics, Faculty of Health, University of Newcastle, Callaghan, NSW 2300, Australia.**Objective:** To investigate the association between home environment and overweight/obesity among adolescents of Ho Chi Minh City (HCMC).**Methods:** Data were obtained from three yearly assessments in a prospective cohort study of 378 males and 407 females from 18 junior high schools. Body mass index (BMI) was assessed and overweight/obesity defined using IOTF cut-offs. We examined the roles of parental education, BMI status and family income, availability of fruit/vegetables at home as well as the child's dietary, sedentary, physical activity behaviors on overweight/obesity. Longitudinal Poisson regression models with generalized estimating equations were examined to assess associations between home environment and overweight/obesity.**Results:** In a model with all data, gender was significantly associated with overweight/obesity (RR = 1.6, 95%CI 1.2, 2.2) after adjusting for other potential risk factors. In gender-specific models, overweight/obesity in girls was 90% lower among those having fruit/vegetable available at home (RR = 0.1, 95%CI = 0.0, 0.9). The risk of being overweight/obesity in boys doubled if they spent >3 hours watching TV (RR 1.8, 95%CI 1.3, 2.5) or frequently consumed snacks (RR 1.6, 95%CI 1.2, 2.2). The risk of overweight/obesity was 20% lower among boys who spent >20 minutes per day on vigorous activities (RR 0.8, 95%CI 0.7, 0.9). Age was negatively associated with overweight/obesity in boys.**Conclusion:** Risk factors for overweight/obesity are different in boys and girls in HCMC. Gender differences should be taken into account when planning intervention programs to prevent overweight/obesity in adolescents.

## T5:PS.80

**Controlling feeding practices and child temperament as predictors of childrens eating styles and weight**

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<sup>1</sup>Loughborough University, Loughborough, United Kingdom; <sup>2</sup>The University of Birmingham, Birmingham, United Kingdom; <sup>3</sup>Loughborough University, Loughborough, United Kingdom.**Background:** Child weight and eating habits have been associated with children's temperament (Nederkorn et al., 2005), and also with exposure to excessive parental controls around feeding and food (Birch et al., 2003). The aims of this study were to examine the relevant contribution of child temperament and parental control to predicting children's eating habits and BMI in a non clinical sample of 10 year old children.**Method:** 75 children (mean age 10.87 years) completed questionnaires about their temperament (Early Adolescent Temperament Questionnaire), parental controlling feeding practices (Kids Child Feeding Questionnaire), their BMI and their external eating, emotional eating and restrained eating (Dutch Eating behaviour Questionnaire).**Results:** Stepwise regressions were used to examine the most significant models to predict children's maladaptive eating styles and BMI. Using stepwise regressions parental restriction was a significant negative predictor of children's restrained eating, parental pressure to eat was a significant positive predictor of child BMI, child impulsiveness was a significant positive predictor of external eating, and child depression was a significant positive predictor of emotional eating.**Conclusions:** Maladaptive eating styles during childhood can be predicted by a combination of various temperamental traits and also by children's perceptions of parental pressure and control around feeding and food. Further research is necessary to evaluate how children's temperamental traits may interact with their caregivers feeding styles in the prediction of eating habits which may promote obesity.

## T5:PS.79

**Are childhood overweight and obesity interventions effective? Reviewing the evidence**C Doak<sup>1</sup>, L Lissner<sup>2</sup>, C Summerbell<sup>3</sup>, T Visscher<sup>1</sup>, B Heitmann<sup>4</sup>FALW, Institute Of Health Sciences, VU Amsterdam<sup>1</sup>; Göteborg University, Göteborg, Sweden<sup>2</sup>; University of Teesside, Middlesbrough, United Kingdom<sup>3</sup>; Institute of Preventive Medicine, Copenhagen, Denmark<sup>4</sup>**Background:** Are childhood obesity interventions effective? Two reviews of interventions preventing childhood overweight and obesity provide opposite answers. Summerbell et al. (2005) found relatively few effective interventions (15%) whereas Doak et al. (2006) review found a majority (71%) of interventions to be effective.**Aim:** To resolve discordant results on effectiveness of interventions.**Methods:** This study will compare differential inclusion and exclusion criteria, using as examples the most influential exclusion from each review. Finally, this study compares effectiveness by outcome.**Results:** A total of 36 studies were included by one or the other review, 10 of which were included in both reviews. Combining all 36 interventions showed 17 effective interventions (47%). The two most influential criteria were exclusion of interventions with a stated aim other than preventing weight gain (Summerbell et al, 2005) and excluding pilot studies (Doak et al. 2005). The first exclusion reduces the effective interventions to 42% (13/31). In contrast, the second exclusion increases the proportion of effective interventions to 54% (17/31). However, outcome assessment shows key differences between skinfold and height/weight results. In these 36 interventions, 63% of interventions are effective by skinfolds whereas only 31% of the interventions are effective by height/weight measures.**Conclusion:** Interpretation of results depends more on how outcomes are assessed than on the inclusion/exclusion criteria. Skinfolds show interventions are mostly effective, whereas outcomes with height/weight measures are not. These results illustrate the need for better measures for monitoring overweight and obesity in children.

## T5:PS.81

**Obesity indices and risk of glucose metabolism regulation in the middle-aged general adult population of Spain. Results from the European DE\_PLAN Study.**

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On behalf of DE\_PLAN Spanish Cooperative Group - Clinical Epidemiology Unit, Hospital Universitario La Paz, Madrid.

**Objectives:** To estimate the frequency of high risk people for Type 2 Diabetes (T2D) according to body mass index (BMI) and waist circumference (WC) in the Spanish middle-aged general population. To estimate the frequency of unknown T2D and Glucose Intolerance (GI) in people with high risk of T2D.**Methods:** Population-based, cross-sectional epidemiological study in Central Spain. Random sample of 1.961 subjects 45-70 years selected from 6 public health registries. BMI, waist and hip circumferences were measured by trained nurses. Categorization of T2D risk with the FINDRISK SCORE (high risk>14 points). In high risk subjects, a standard 2-hour OGTT was performed to rule-out T2D or GI.**Results:** 57% women, mean age: 57.5± 8 years, 585 subjects (29%) showed high risk of T2D (FINDRISK score >14). 32% were obese (BMI> 30) and 47% had an elevated waist circumference (>102 cm in males or >88 cm in females).

In the general population (n=1961), 25% of males and 34% of females showed high risk of developing T2D. The FINDRISK mean scores and percent of subjects with high risk of T2D, increased significantly with BMI (Table 1a) and WC (Table 1b) in both, males and females (p&lt;0.001 for all comparisons).

Table 1a

BMI	FINDRISK SCORE			FEMALES		
	MALES			Mean Score	>14 points	p
< 25	Mean Score	>14 points	P	7.1	19 (1.7%)	<0.001
26-30	10.0	8 (1%)	<0.001	10.9	124 (11%)	
> 30	14.2	67 (8%)		15.1	235 (21%)	
<b>Total</b>	<b>837</b>	<b>207 (25%)</b>		<b>1124</b>	<b>378 (34%)</b>	

Table 1b

Waist circum.	FINDRISK SCORE			FEMALES		
	MALES			Mean Score	>14 points	p
Normal	Mean Score	>14 points	p	8.37	55 (4.9%)	<0.001
Elevated*	13.76	54 (6.5%)	<0.001	13.99	323 (28.7%)	
<b>Total</b>	<b>837</b>	<b>207 (25%)</b>		<b>1124</b>	<b>378 (34%)</b>	

high risk subjects (n=585): 17% had unknown T2DM, and 34% (GI or IFG). Frequencies of GI and T2D were respectively 28% and 25% in obese women, compared to 3.8% and 1.9% in normal women. 35% of high risk obese males had unknown T2D in the OGTT and 24% GI; corresponding figures for normal weight males were 2.7% and 1% respectively. Subjects with elevated WC shown higher significant rates of T2D and GI (48% and 44% in women vs. 35% and 40% in males) than people with normal WC.

**Conclusion:** There is a substantial percentage of subjects with obesity and abdominal obesity in the middle aged general population of Spain. The risk of T2D is strongly associated to both BMI and WC in the general population. In T2D high risk people, the frequency of unknown T2D and GI is also strongly associated to BMI and WC in both males and females..

## T5:PS.82

**Infant weight gain, duration of exclusive breastfeeding and childhood body mass index - two similar follow-up cohorts**

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<sup>2</sup>Department of Human Nutrition, Centre of Advanced Food Studies, Faculty of Life Sciences, University of Copenhagen, Copenhagen, Denmark.

<sup>3</sup>Institute of Preventive Medicine, Copenhagen University Hospital, Centre for Health and Society, Copenhagen, Denmark.

**Background and Objectives:** The aim of the present study was to describe the association between duration of exclusive breastfeeding (EBF), weight-gain in infancy and childhood body mass index (BMI) using two cohorts from Iceland and Denmark. Several meta-analysis have shown an effect of breastfeeding on later obesity, but most are from populations with short duration of EBF.

**Subjects and Methods:** Breast-feeding status was reported monthly during infancy. Weight and length was measured at birth, 2, 6, and 12 months of age as well as in childhood at 6- or 10-years of age.

**Results:** EBF for 2 months or less resulted in 350-400 g more weight gain from 2 to 6 months of age than EBF for 3-4 months ( $p=0.009$ ) and  $\geq 5$  months ( $p=0.068$ ). A trend of more weight gain from 6 to 12 months of age was similarly found with shorter EBF, i.e., EBF for 2 months or less gave the highest weight gain and EBF for 5 months or more the lowest. A greater weight change, in terms of Z-scores, between the age of 2 months to the age of 6 months, was associated with higher Z-score of childhood BMI ( $B=0.49\pm 0.11$ ,  $p<0.001$ , adj.  $R^2=0.15$ ).

**Conclusions:** Longer duration of EBF was associated with lower weight gain from 2 months of age throughout infancy. Weight gain in infancy was associated with higher childhood BMI. Exclusive breastfeeding may modulate growth rate in infancy and thereby possibly prevent excessive rise in childhood BMI, but other factors determinative for growth in infancy needs to be identified too.

**Funding:** The collaboration which the present paper is based on is part of the Nordic longitudinal epidemiologic research program "Prenatal and Childhood Growth in Relation to Cardiovascular Disease" (the NordNet Study) is funded by NordForsk, the Nordic Research Board. The initial studies were supported by, The Icelandic Centre for Research (The Icelandic Infant Study) and The Danish Research Councils and FØTEK (The Danish Research and Development Programme for Food and Technology).

## T5:PS.85

**Food-related parenting dimensions and child eating behaviours**

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Theory and research suggest that children's BMI is associated with their responses to food and satiety, but also can be influenced by parenting. In this study, associations were expected between food-related parenting, children's responses to food and satiety (i.e., *eating behaviours*), and child BMI. A new measure of three positive and three negative food-related parenting dimensions was developed based on a comprehensive parenting theory founded in Self-Determination Theory (Skinner et al., 2005). The six dimensions of food-related parenting include warmth, structure, autonomy support, rejection, chaos, and coercion. Questionnaires were completed by parents (94% female) of 247 young children ( $M = 5.73$  years, 50% female). Children's weight and height were measured at school. Factor analysis of the new measure revealed six factors; each had high internal consistency. Parenting was significantly associated with child eating behaviours, in the expected directions ( $r$ s ranging from  $|.13|$  to  $|.44|$ ). The negative parenting dimensions were associated with the widest range of children's eating behaviours, with parental coercion the strongest correlate. The positive parenting dimensions were predominantly correlated with children's enjoyment of food (i.e., children's normal, healthy variation in appetite). Parents' own eating behaviours, and their weight and shape concerns were associated with parenting ( $r$ s from  $|.14|$  to  $|.34|$ ), and child BMI was significantly associated with children's eating behaviours in the predicted directions ( $r$ s from  $|.18|$  to  $|.367|$ ).

## T5:PS.83

**The social determinants of overweight and obesity in Canada: A multilevel analysis of the Canadian Community Health Surveys, 2001-2005.**

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The importance of the social determinants of health in the production of chronic disease has been well established in such seminal publications as the Lalonde report (1974), the Ottawa Charter for Health Promotion (1986) and the Toronto Charter on the Social Determinants of Health (2003). While theoretical advances in understanding these determinants have recently been described (Public Health Agency of Canada, 2005), the interaction of the social determinants of health (income, education, social support, housing, food security, social exclusion, among others) with proximal risk factors for overweight and obesity (including physical activity, sedentary behaviours, nutritional markers and smoking and alcohol use) in a spatial context (health region and province of residence) has been considerably less developed. In the current study, multilevel logistic regression was used to predict the prevalence of overweight and obesity at regional and provincial levels, using data from three consecutive cycles of the Canadian Community Health Surveys (2001, 2003, 2005). Significant social, behavioural and geographic effects were observed, after controlling for regional and provincial heterogeneity in overweight and obesity. The relevant knowledge transfer mechanisms for health and social welfare are described, with a particular emphasis on the utility of multilevel modelling for researchers and policymakers in Canada and abroad.

## T5:PS.86

**Development of a policy analysis tool for obesity prevention: the contribution of EURO-PREVOB**

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EURO-PREVOB is a three-year EU-funded project linking science and policy-making to promote and support collaboration across existing networks, with the aim of tackling the social and economic determinants of obesity in Europe ([www.europrevob.eu](http://www.europrevob.eu)).

A key objective of EURO-PREVOB is to develop and pilot a policy analysis tool to assist stakeholders in assessing the potential impact of policies on determinants of obesity that are appropriate to different sub-regional contexts. Seven 'street-level' policy areas covering food and nutrition, physical activity, socioeconomic status and inequalities in obesity have been identified for a comparative evaluation in six countries from different European sub-regions. The present policy analysis aims to understand the processes through which these policy areas are developed and implemented, the aims and motives behind the policies, and the potential for improvement in terms of policy development and implementation processes.

Work is organized around the preparation of a concept paper reviewing the existence and effectiveness of policy analysis tools in the health field, ways of analyzing the results and priority setting. The methodological conclusions of the concept paper will feed into the policy analysis tool development which will in turn be subjected to external evaluation by experts before being piloted in countries. The policy analysis tool is currently being developed and will be presented at the ECO 2008.

**Funding:** Research relating to this abstract was funded by the European Commission's 6<sup>th</sup> Framework Programme (Project no. 044291)

## T5:PS.87

**Addressing childhood obesity through promoting mineral water consumption in primary schools – the HAPPY Project**

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**Objective:** The intent of the HAPPY (Hungarian Aqua Promoting Program in the Young) program was to evaluate whether promoting water consumption by providing free availability of mineral water could decrease soft drinks consumption in primary-school-age children.

**Methods:** In total, 397 children (202 boys, 195 girls; 7-10 yrs) from 6 different schools were recruited. The 2-month intervention consisted of promoting mineral water intake by (1) 40-minute educations and leaflets about the adequate fluid consumption, and (2) providing free availability of mineral water in the classrooms by bottled water coolers. At baseline and after the program, all children filled out questionnaires about knowledge of fluid consumption, and about beverage consumption habits overall and at school. After the program, an additional questionnaire (effects of the program on beverage intake of the children and the family, satisfaction with the program, weight and height of parents and the child measured by the parents) was made for parents.

**Results:** During the 2 months, children consumed 285 tanks (5415 liter) mineral water. 92% of the students drank mineral water from the cooler at least once a day. With an emphasis on practical and fun learning, the knowledge of the children has improved markedly. In addition, mineral water consumption increased (0.37±0.2 vs. 0.46±0.2 l/d) and soft drink consumption decreased (0.26±0.3 vs. 0.20±0.2 l/d) significantly after the 2-month period.

**Conclusion:** Providing free availability of mineral water as a healthy choice for beverage intake seems to be a good practice to reduce soft drinks consumption in children.

**Funding:** Research was founded by WHO (project number: BCA-HUN 06-07).

## T5:PS.89

**Prevalence of normal weight obesity in Switzerland: Effects of various definitions**

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**Background:** normal weight obesity (NWO) is defined as an excessive body fat associated with a normal body mass index (BMI<25 kg/m<sup>2</sup>), but its prevalence in the general population is unknown.

**Objective:** to assess the prevalence of NWO in Switzerland according to different cut points used to define excess body fat.

**Design:** cross-sectional study including 3,213 women and 2,912 men aged 35-75 years. Body fat was assessed by bioimpedance and prevalence of NWO was assessed using four previously published definitions for excess body fat.

**Results:** % body fat increased with age: in men, the values (mean ± SD) were 20.2 ± 5.4, 23.0 ± 5.4, 26.3 ± 5.2 and 28.2 ± 4.6 for age groups [35 – 44], [45 – 54], [55 – 64] and [65 – 75] years, respectively; the corresponding values for women were 29.9 ± 7.8, 33.1 ± 7.4, 36.7 ± 7.5 and 39.6 ± 6.9. In men, prevalence of NWO was <1% irrespective of the definition used. Conversely, in women, a one to twenty fold difference (from 1.4% to 27.8%) in NWO prevalence was found. The prevalence of NWO increased with age when age-independent cut points were used in women, but not in men.

**Conclusions:** prevalence of NWO is low in the general population and higher in women than in men. The prevalence is highly dependent on the criteria used to define excess body fat, namely in women. The use of gender- and age-specific cut points to define excess body fat is better than fixed or gender-specific only cut points.

## T5:PS.88

**Diagnostic accuracy of body mass index, body fat and waist in defining low aerobic fitness in adolescents**

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**Objective:** to assess the diagnostic accuracy of different anthropometric markers in defining low aerobic fitness among adolescents.

**Methods:** cross-sectional study on 2,331 boys and 2,366 girls aged 10 – 18 years. Body mass index (BMI) was measured using standardized methods; body fat (BF) was assessed by bioelectrical impedance. Low aerobic fitness was assessed by the 20-meter shuttle run using the FITNESSGRAM<sup>®</sup> criteria. Waist was measured in a subsample of 1,933 boys and 1,897 girls. Overweight, obesity and excess fat were defined according to the International Obesity Task Force (IOTF) or FITNESSGRAM<sup>®</sup> criteria.

**Results:** 38.5% of boys and 46.5% of girls were considered as unfit according to the FITNESSGRAM<sup>®</sup> criteria. In boys, the area under the ROC curve (AUC) and 95% confidence interval were 66.7 (64.1 – 69.3), 67.1 (64.5 – 69.6) and 64.6 (61.9 – 67.2) for BMI, BF and waist, respectively (P<0.02). In girls, the values were 68.3 (65.9 – 70.8), 63.8 (61.3 – 66.3) and 65.9 (63.4 – 68.4), respectively (P<0.001). In boys, the sensitivity and specificity to diagnose low fitness were 13% and 99% for obesity (IOTF); 38% and 86% for overweight + obesity (IOTF); 28% and 94% for obesity (FITNESSGRAM<sup>®</sup>) and 42% and 81% for excess fat (FITNESSGRAM<sup>®</sup>). For girls, the values were 9% and 99% for obesity (IOTF); 33% and 82% for overweight + obesity (IOTF); 22% and 94% for obesity (FITNESSGRAM<sup>®</sup>) and 26% and 90% for excess fat (FITNESSGRAM<sup>®</sup>).

**Conclusions:** BMI, not body fat or waist, should be used to define low aerobic fitness. The IOTF BMI cut-points to define obesity have a very low screening capacity and should not be used.

## T5:PS.90

**The Remote Food Photography Method: An innovative method to measure the food intake of free-living people**

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**Objective:** Few methods exist to reliably and accurately measure food intake in free-living people, and this negatively affects obesity treatment and research. The purpose of this study was to test the accuracy of the Remote Food Photography Method (RFPM) for measuring food intake. The RFPM is a novel method that consists of digital camera-enabled cell phones with wireless data transfer capabilities. Photographs of food selection and plate waste are taken and transmitted to researchers for analysis.

**Methods:** Participants (N=52, 20≤BMI≤35) were randomly assigned to a dine-in or take-out group. Food intake was measured for three days at lunch and dinner. The dine-in group ate lunch and dinner in the laboratory. The take-out group ate lunch in the laboratory and dinner in free-living conditions. The take-out group was given a cooler containing pre-weighed dinner (plate waste was weighed when the cooler was returned the following morning). Food intake was measured with the RFPM and by directly weighing foods. Food intake estimated with the RFPM was compared to directly weighed intake using Bland-Altman analyses.

**Results:** Food intake estimated with the RFPM correlated highly with weighed intake in laboratory and free-living conditions (*r*<sup>2</sup>>.93, *p*<.0001). The RFPM underestimated food intake by -4.7% (*p*=.046) and -5.5% (*p*=.076) in the laboratory, and -6.6% (*p*=.017) in free-living conditions. Bias did not differ by food intake levels.

**Conclusions:** The error associated with the RFPM is small compared to self-report methods and consistent across food intake levels. The RFPM is a promising approach to food intake measurement.

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## T5:PS.91

**Increased use of prescription drugs in overweight and obese persons**

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**Aim:** The aim of this study was to compare the use of prescription drugs in normal weight (BMI < 25 kg/m<sup>2</sup>), overweight (BMI 25-30 kg/m<sup>2</sup>) and obese (BMI > 30 kg/m<sup>2</sup>) persons.

**Methods:** We used data of the Doetinchem Cohort study, a population-based longitudinal study. For these analyses we have used cross-sectional data on 3582 persons examined between 1998 and 2002 (pregnant women excluded) for whom drug dispensing data were available from the PHARMO database. This database includes pharmacy records of drugs coded according to the WHO Anatomical Therapeutic Coding (ATC) system. Persons were defined as user if they had filled at least one prescription in the year around (+/- 6 months) the examination.

**Results and Conclusions:** Use of almost all commonly used (prevalence > 5%) drug classes was significantly higher in obese persons than in normal weight persons. The difference was most pronounced for cardiovascular (41% vs 15%,  $P < 0.001$ ) and musculo-skeletal (40% vs 23%,  $P < 0.001$ ) drugs. These differences were particularly due to beta blocking agents, lipid reducing agents, and agents acting on the renin-angiotensin system, and use of anti-inflammatory and anti-rheumatic agents, respectively. The use of general anti-infectives was similar (28% vs 25%,  $P = 0.48$ ), and the use of drugs for the genito urinary system (17% vs 24%,  $P < 0.001$ ) was lower, in obese than in normal weight persons. Also overweight persons used more prescription drugs of almost all drug classes, but the differences were smaller than for obese persons.

**Future research:** We will also present data on the relation of use of prescription drugs and weight change in the preceding years.

**Funding:** Research related to this abstract was funded by the Dutch Ministry of Health, Welfare, and Sports

## T5:PS.93

**Validating the waist circumference to height ratio for use amongst children and adolescents.**

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**Introduction:** Body Mass Index (BMI) is widely used for assessing overweight and obesity in children. Recently, waist circumference to height ratio (WHtR) has been proposed to be of greater value in predicting obesity related co-morbidities in children. This ratio, however, has not been extensively validated within the paediatric population. The aim of this study was to assess the validity of this index as an appropriate method of adjusting waist circumference for height, in a cohort of Australian children and adolescents.

**Methods:** Height (Ht) and waist circumference (WC) were measured in 3600 children (1737 boys and 1863 girls), from grades 1 (5-7yrs), 5 (9-11yrs) and 10 (15-17yrs), as part of the Healthy Kids Queensland: Physical Activity and Nutrition Survey in 2006. Natural logarithms of waist circumference (cm) and height (cm) were used in regression analyses to determine appropriate powers ( $p$ ) to raise height, to completely adjust the index for height, by sex and age. Correlations between WHtR and Ht were also assessed.

**Results:** Statistically, WHtR is only valid for use among boys and girls aged 5-7yrs ( $p = 1.091$  (95%CI 0.953-1.229) and  $p = 1.051$  (0.907-1.195), respectively) and girls aged 15-17yrs ( $p = 0.849$  (0.616-1.082)). However, the error (0.002%-1.00%) associated with the use of this index, in all ages and both sexes is clinically and biologically acceptable.

**Conclusion:** The WHtR is a valid ratio to use among Australian children and adolescents. It may be more appropriate to use than BMI and further investigation can now be undertaken to evaluate its role in predicting health risks.

## T5:PS.92

**Changes in body composition indices following a 12-month intervention with fortified dairy and calcium supplementation.**

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**Introduction:** Several previous studies have reported inverse associations between calcium intake and adiposity indices. We examined whether supplementation of calcium or dairy products enriched with calcium and vitamin D<sub>3</sub> in postmenopausal women for 12 months could induce favourable changes in several anthropometric and body composition indices.

**Materials and methods:** A sample of 101 postmenopausal women were randomized to a dairy intervention group (DG; n=39), receiving approximately 1200 mg of calcium and 7.5 µg of vitamin D<sub>3</sub> per day via fortified dairy products and attending biweekly nutrition education sessions; a calcium supplemented group (CaG; n=26) receiving a total of 1200 mg calcium per day; and a control group who continued with their usual diet (CG; n=36).

**Results:** No significant differences were observed in the mean 12-month changes in body weight, BMI, total body fat and lean mass between groups. However, subjects in the DG were found to have a lower decrease in mid-arm muscle circumference ( $P < 0.001$ ) and a lower increase in the sum of skinfolds' thickness ( $P = 0.042$ ) compared with the CaG and the CG. Furthermore the DG was also found to have a greater decrease in the percentage of legs' fat mass ( $P = 0.025$ ) and a higher increase in legs' lean mass ( $P = 0.012$ ) compared with the two other groups.

**Conclusion:** The application of a holistic intervention approach combining nutrition education and consumption of fortified dairy products for 12 months can induce more favourable changes in certain anthropometric and body composition indices than calcium supplementation alone and the usual diet.

**Conflict of Interest:** Yannis Manios also works as a part-time scientific consultant for Friesland Foods Hellas. None of the other authors had any potential conflict of interest.

**Funding:** Research relating to this abstract was funded by Friesland Foods Hellas.

## T5:PS.94

**Should early childhood be a focus for obesity prevention? Applying a framework for setting priority target groups**

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**Background:** Early childhood (up to age five) is often advocated as a priority period for obesity prevention interventions. At face value this contention makes intuitive sense, however a critical analysis may argue against this age group being a priority in the context of inevitably limited resources.

**Aim:** To develop a framework for systematically evaluating the issues which may determine priority groups for obesity prevention and to apply this to the case for prioritising early childhood.

**Methods:** Key topics affecting the need for, and likely effectiveness of, interventions to prevent obesity were identified. These topics were grouped into major themes ('key questions') based on an adaptation of the issues identified in the IOTF framework for evidence-based obesity prevention. Potential outcomes were then classified as supporting or opposing priority status.

**Results:** The key questions within the framework covered: the current status of early childhood overweight and obesity (prevalence, trends, socio-demographic correlates, political and policy context); potential points of intervention (modifiable risk or protective behaviours); opportunities for intervention (settings and sectors), and; effect of intervention (effectiveness of interventions, stability/tracking of behaviours). Currently available evidence can answer only some of the key questions for the early childhood period.

**Conclusions:** The priority analysis framework identified critical evidence gaps that need to be filled before early childhood can be fully justified as a priority age-group for obesity prevention. However, the magnitude of the childhood obesity epidemic demands urgent action at all ages, which if well evaluated, should contribute to filling the gaps in evidence.

**Funding:** Melanie Nichols is supported by an Australian Research Council Australian Postgraduate Award (project number LP0560400)

## T5:PS.95

**Does Health Related Quality of Life predict the natural course of overweight and obesity in schoolchildren?**Petersen, S<sup>1</sup>, Hägglöf, B<sup>1</sup>, Bergstrom, E<sup>1</sup><sup>1</sup>Umeå University, Umeå, Sweden

**Introduction:** Very little is known about the association between HRQoL and childhood overweight/obesity in the general population. The information is scarce, especially in European children. This longitudinal population based study will investigate the association of HRQoL and future overweight/obesity in schoolchildren.

**Methods:** The study was performed in Umeå, a university city in northern Sweden. All schoolchildren attending grade 3 and 6 (n=1660) completed a validated HRQoL-questionnaire (the PedsQL) year 2003/4. From the school health records anthropometrics were collected at baseline as well as after one and three years. Overweight was estimated according to classifications recommended by the International Obesity Task Force.

**Results:** At baseline, 21,6% of the children had overweight/obesity and the HRQoL scores were lower in children with overweight/obesity than in non-overweight children. Data from the follow-up survey is currently being processed and the association between HRQoL and overweight after one year as well as 3 year will be presented for children from grade 3 and 6.

**Conclusion:** The relevance of self rated HRQoL as a predictor of the natural course of overweight/obesity in schoolchildren will be presented

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## T5:PS.97

**The development of a tailored childhood obesity prevention policy**Procter KL<sup>1</sup>, Ransley JK<sup>2</sup>, Clarke GP<sup>3</sup>, Cade J<sup>2</sup><sup>1</sup> Cancer Epidemiology Group, University of Leeds, Leeds, UK<sup>2</sup> Nutritional Epidemiology Group, University of Leeds, Leeds, UK<sup>3</sup> School of Geography, University of Leeds, Leeds, UK

**Background:** Reducing childhood obesity are at the centre of the UK government's health policy. This paper demonstrates the utility of micro-level spatial analysis and ecology modelling to facilitate the development of an effective local policy to prevent obesity.

**Methods:** Childhood obesity was defined by body mass index, using cross-sectional height and weight data for children aged 3-13 years (obesity > 98<sup>th</sup> centile; British reference dataset). Hot spots of childhood obesity were determined (using SaTScan). Relationships between obesity and simulated obesogenic variables (from the Health Survey for England 2002 and the Expenditure and Food Survey 2005) were assessed using geographically weighted regression, thereby identifying the key global and local determinants of childhood obesity. The existing evidence base was used to develop an ecology framework for a comprehensive obesity prevention policy, which was tailored to each case study locality using the results of the spatial analysis.

**Results:** Obesity was shown to vary greatly, with hot spots in deprived and affluent areas. Twelve simulated covariates were determined as having a strong relationship with obesity. The most important determinants globally and locally were different, plus the key local determinants were different in different wards. This enabled the generic ANGELO-style obesity policy to be modified to allow for each neighbourhood's nuances.

**Discussion:** This paper shows how policy can be tailored to the specific needs of each micro-area, and suggests that solutions need to be tailored to the locality to be most effective. For maximum benefit an obesity prevention policy needs to take a coordinated, multi-component, multi-sectorial public health approach.

**Funding:** The research relating to this abstract was funded by the ESRC and MRC.

## T5:PS.96

**Eating behavior in obesity – A study in monozygotic and dizygotic twins**Pietiläinen, KH<sup>1,2,3</sup>, Korkeila M<sup>1,2</sup>, Yki-Järvinen, H<sup>1</sup>, Kaprio, J<sup>2,4</sup>, Rissanen A<sup>1</sup><sup>1</sup> Obesity Research Unit, Department of Psychiatry; Helsinki University Central Hospital, Helsinki, Finland<sup>2</sup> Finnish Twin Cohort Study, Department of Public Health, University of Helsinki, Helsinki, Finland<sup>3</sup> Department of Medicine, Division of Diabetes, Helsinki University Central Hospital, Helsinki, Finland<sup>4</sup> Department of Mental Health and Alcohol Research, National Public Health Institute, Helsinki, Finland

**Background:** Obese subjects are believed to eat more and have less healthy eating patterns than normal weight subjects. This assumption, difficult to verify in self-reported data, was explored using co-twin cross-validation and objective measures of energy expenditure in young adult twins.

**Methods:** Comparisons of proxy responses from co-twins and self-reports on questions of eating behavior were studied in 2120 monozygotic and same-sex dizygotic twin pairs aged 22-28 years. Energy intake (EI) was examined by 3-day diaries and total energy expenditure (TEE) by doubly-labeled water in the top 5% most obesity-discordant monozygotic pairs (n=14) and matched control pairs (n=10).

**Results:** Using responses where both twins answered similarly, the twins who were rated to eat more, snack more, choose less healthy foods, eat more fatty foods and sweet and fatty delicacies, were significantly heavier than their co-twins in both monozygotic and dizygotic pairs. Within weight-discordant monozygotic pairs ( $\Delta$ BMI 5.2 kg/m<sup>2</sup>), both co-twins consistently agreed that obese co-twins ate more and had less healthy eating habits than non-obese co-twins. In food diaries, daily EI was similar in obese (9.6 MJ/d) and non-obese co-twins (9.8 MJ/d) which was due to significant underreporting in obese (3.2 MJ/d, 25% of TEE) but not in non-obese co-twins (0.8 MJ/d, 8% of TEE). Underreporting was directed specifically at sweet and high-fat delicacies.

**Conclusions:** Obesity is characterised by excess energy intake and unhealthy eating but due to a considerable underreporting, self-reported food intake is unreliable. Using twins as mutual proxy respondents can significantly increase accuracy of self-reported eating behavior.

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## T5:PS.98

**Virgin olive oil consumption may reverse the higher risk of abdominal obesity in carriers of 12Ala allele of the PPAR $\gamma$  gene**Razquin C<sup>1</sup>, Martínez JA<sup>1</sup>, Serrano M<sup>2</sup>, Martínez-González MA<sup>2</sup>, Estruch R<sup>3</sup>, Martí A<sup>1</sup>, for the PREDIMED Project.<sup>1</sup> Department of Nutrition and Food Sciences, Physiology and Toxicology, University of Navarra, Spain<sup>2</sup> Department of Preventive Medicine and Public Health, School of Medicine-Clinica Universitaria, University of Navarra, Spain<sup>3</sup> CIBER Fisiopatología Obesidad y Nutrición (CB06/03), Department of Internal Medicine, Hospital Clinic, Institut d'Investigacions Biomèdiques August Pi Sunyer (IDIBAPS), Barcelona, Spain

**Introduction:** The peroxisome proliferator-activated receptor gamma (PPAR $\gamma$ ) regulates insulin sensitivity and adipogenesis. The Pro12Ala polymorphism of this gene has been related to visceral fat depot. Moreover some studies have reported interactions between the Pro12Ala genotype and fatty acid intake on insulin resistance and BMI.

The aim of this study was to analyze the effect of the Pro12Ala polymorphism on abdominal obesity in a randomized dietary trial assessing the effect of a Mediterranean-style diet in high cardiovascular risk patients.

**Methods:** A total of 750 high-risk subjects aged 55-80 were recruited. Each subject was randomly assigned to one of three nutritional intervention groups: two of them were advised to follow a Mediterranean-style diet, one with high intake of virgin olive oil and the other with high intake of nuts. The third group was a control group that was advised to follow a conventional low-fat diet. All the participants were genotyped by real time PCR followed by allelic discrimination.

**Results:** Carriers of the 12Ala allele had a statistically significant higher waist circumference (regression coefficient=1.894; p=0.001) compared to wild type subjects after two years of nutritional intervention. When the analysis was performed taking together the genotype and the nutritional group, this adverse effect was not observed among 12Ala carriers allocated to olive oil group.

**Conclusion:** Subjects with the 12Ala allele of the PPAR $\gamma$  gene had a higher risk of abdominal obesity than non carriers. It seems that virgin olive oil reverses the effect of Pro12Ala on visceral fat protecting against a higher waist circumference.

**Funding:** Research relating to this abstract was funded by the Health Department of the Navarra Government and *Linea especial on Nutrition, Obesity and Health* (University of Navarra).

## T5:PS.99

**The effect of a high monounsaturated fatty acid, low glycemic index diet and a low fat diet on satiety, appetite regulatory hormones and glucose metabolism during a 6 mo weight maintenance period.**Sloth B<sup>1</sup>, Due A<sup>1</sup>, Larsen TM<sup>1</sup>, Holst JJ<sup>1</sup>, Heding A<sup>2</sup>, Astrup A<sup>1</sup><sup>1</sup>University of Copenhagen, Copenhagen, Denmark; <sup>2</sup>7TM Pharma, Hoersholm, Denmark

**Objective:** We aimed to test the effects of 3 different weight maintenance diets on subjective ratings of appetite, postprandial secretion of appetite regulatory hormones, glucose and fat metabolism following an initial low calorie diet (LCD) induced body weight loss.

**Design:** Following an 8-wk LCD and a 2-3 wk refeeding period subjects were randomized to 3 diets for 6 mo: **MUFA:** Moderate-fat (35-45E%), high in MonoUnsaturated-Fatty-Acid with low glycemic index; **LF:** Low Fat (20-30E%) or **CTR:** ConTRol (35E% fat). A meal test study was performed before and after the 6 mo dietary intervention.

**Results:** No difference in body weight, energy intake or appetite ratings were observed between diets. Both the LF and MUFA diets compared to CTR diet reduced postprandial glycaemia and insulinemia and lowered fasting insulin from mo 0 to 6. Following the 8-wk LCD period lower levels of the appetite regulating peptides: PP, PYY, GLP-1 and GLP-2 along with increased appetite scores were seen in comparison to measurements performed after the 6 mo dietary intervention.

**Conclusions:** The two competing diets, MUFA and LF, were equally good with respect to glucose metabolism, whereas the CTR diet resembling the typical Western diet, high in saturated fatty acids, sugar and high glycemic carbohydrates resulted in higher postprandial glucose- and insulin responses. Lower levels of appetite regulatory peptides along with increased appetite scores following an 8-wk LCD and 2-3 wk refeeding period, suggest that strategies for physiological appetite control following a LCD period are needed, in order to prevent weight regain.

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## T5:PS.101

**Impact of water coolers on Sugar sweetened beverages sales in Dutch secondary schools: a comparative trial**Hal van, WCW<sup>1</sup>, Visscher TLS<sup>2</sup>, Blokdijk L<sup>1</sup>, Seidell JC<sup>2</sup>, Bemelmans WJE<sup>1</sup><sup>1</sup>National Institute for Public Health and the Environment, Centre for Prevention and Health Services Research, Bilthoven, The Netherlands<sup>2</sup>Vrije Universiteit-Windesheim/ Research Centre Prevention Overweight Zwolle (OPOZ), Amsterdam/ Zwolle, The Netherlands

**Background:** Intake of sugar sweetened beverages (SSB) is positively associated with energy intake among adolescents and increased risk of becoming obese. The supply of water in schools may reduce school-related SSB consumption and thereby contribute to overweight prevention. This study aimed to investigate the effect on SSB intake of adolescents of placing water coolers next to soda vending machines in secondary schools.

**Methods:** Six secondary schools in Zwolle, including 5866 students, were divided in 3 intervention – and 3 control schools. In the intervention schools, water coolers were placed next to every soda vending machine. The sales of beverages and use of water was measured during a pre -intervention period (6 weeks) and four times during a three month intervention period. In addition, usage of the water coolers and vending machines by students was observed. After the intervention period, more than 500 students completed a questionnaire about their drinking habits.

**Results:** During the intervention period, SSB sales in the intervention schools increased and water consumption decreased. Observation shows that 33 of the 656 students used the vending machines per day. Furthermore, students brought SSB mostly from home.

**Conclusions:** Placement of water coolers at schools shows no consistent effect on SSB sales. However, observations and the questionnaire showed that students don't use the soda vending machines frequently.

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## T5:PS.100

**Bullying in childhood and obesity in adulthood.**M. Vámosi<sup>1</sup>, M. Thinggaard<sup>1</sup>, B. L. Heitmann<sup>2</sup>, K. O. Kyvik<sup>1,3</sup><sup>1</sup>The Danish Twin Registry, Epidemiology, Institute of Public Health, University of Southern Denmark, Denmark; <sup>2</sup>Institute of Preventive Medicine, Centre for Society and Health, Copenhagen University Hospitals, Denmark; <sup>3</sup>Institute of Regional Health Services Research

**Background:** It is well recognized that both genes and the environment are important determinants for obesity. Other risk factors include the psychosocial factors and early psycho-social exposures may be associated with obesity later in life. We examined associations between being bullied in school and being overweight or obese in adulthood

**Study design:** In the Danish Twin Registry 144 pairs of twins (monozygotic as well as dizygotic) were discordant for obesity, i.e. one twin had a normal BMI (between 20 and 25 kg/m<sup>2</sup>) and the other had a BMI over 30 kg/m<sup>2</sup>. The twins were invited to an interview about their experiences in childhood. Seven validated questionnaires were used and one of these included 13 questions about being bullied in primary school. The interviews were supplemented by physical measurements and blood samples.

**Results:** The interviews began in April 2006. In total 82 % of the twins participated, and 128 said yes and 56 participants said no to have being bullied in childhood. The participants who had been bullied had a BMI which was on average 1.3kg/m<sup>2</sup> (p = 0.03) higher at the age of 20 years compared to those not bullied. A growth-curve analysis showed that this difference was sustained throughout life.

**Conclusion:** It seems from the preliminary analysis that independent of other lifestyle and familial obesity, being bullied in childhood may be associated with overweight and obesity in adulthood.

## T5:PS.102

**Dairy consumption and 6-year changes in body weight and waist circumference in middle-aged french adults**Vergnaud, AC<sup>1</sup>, Péneau, S<sup>1</sup>, Chat-Yung, S<sup>1</sup>, Kesse, E<sup>1</sup>, Czernichow, S<sup>1,2</sup>, Galan, P<sup>1</sup>, Hercberg, S<sup>1,2</sup>, Bertrais, S<sup>1</sup><sup>1</sup>INSERM, U557; INRA, U1125; CNAM, EA3200; Paris13 University; CRNH Idf, Research Unit on Nutritional Epidemiology, Bobigny, France<sup>2</sup>Public Health Department, Avicenne Hospital, Bobigny, France

**Background:** Calcium intake may play a role in the regulation of body composition. Some studies displayed an inverse relationship between calcium intake and body weight or fat mass.

**Aim:** The aim of this study was to investigate the relationships of dairy consumption and/or calcium intake with 6-year changes in body weight and waist circumference (WC).

**Methods:** Middle-aged French adults (1,022 women and 1,245 men) were divided into quartiles of dairy consumption and/or calcium intakes. Age-adjusted comparisons, stratified by sex and body weight status at baseline, were presented because of significant interactions. Multivariate analyses included additional adjustment for baseline outcome value and other potential dietary or behavioral confounders.

**Results:** In men who were overweight at baseline, 6-y change in weight was borderline inversely related to total dairy product consumption (from +2.45 kg for the lowest quartile to +1.61 kg for the highest quartile, p for trend <0.06). In particular, in overweight men, significant inverse trends were found between the changes in weight and waist circumference and the consumption of both milk and yogurt. But no relationship was observed with daily intakes of cheese and of total or dairy calcium. In women, only a positive association between 6-y weight change and yogurt consumption in normal-weight women was found.

**Conclusions:** Our data suggest that the relationship of dairy products and calcium intake with changes in weight and waist circumference may differ according to sex, initial body weight status and type of dairy products.

**Funding:** this research was supported by the French National Health Ministry (grant from the Direction Générale de la Santé).

## T5:PS.103

**Risk of obesity has spread to all socio-economic groups in the UK: a prospective childhood study**

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**Background:** Lifestyle interventions to tackle obesity still target areas of relative deprivation, but the evidence for doing so is largely historical.**Aim:** To examine the link between deprivation and obesity in contemporary UK children.**Methods:** 266 children (146 boys) from the EarlyBird Study, attending 53 primary schools in a mainly urban setting, covering a wide socio-economic range. Postcode-based Index of Multiple Deprivation (higher IMD score = greater deprivation). Mean IMD score of cohort was 21.7 (range 6.5-73.0), similar to UK mean of 26.3. Waist circumference, BMIs, and sum of skinfolds at 5y and 8y. **Results:** BMI tended to be lower, rather than higher, in the more deprived boys at 5y ( $r=-0.17$ ,  $p=0.05$ ) and 8y ( $r=-0.14$ ,  $p=0.09$ ). Waist circumference was also inversely related to IMD score at 5y ( $r=-0.20$ ,  $p=0.02$ ) and 8y ( $r=-0.18$ ,  $p=0.03$ ). Boys' skinfolds were not significantly related to IMD score at either age (both  $p<0.20$ ). There were no significant associations between IMD score and any measure of adiposity in girls (all  $r<0.07$ , all  $p>0.43$ ). Similar findings were obtained using alternative measures of socio-economic status including parental occupation and income. Importantly, changes in adiposity between 5y and 8y were unrelated to IMD (all  $r<0.15$ ,  $p>0.10$ ).**Conclusion:** Our data do not support the popular assumption that obesity is more prevalent among poorer children - indeed, there was statistically significant evidence to the contrary in the boys, making lack of power an unlikely cause. All socio-economic groups now appear to be at risk of obesity, with important implications for health spending.

## T5:PS.105

**Risk and protective factors for obesity among Abu Dhabi youth: Lessons from the Global School-Based Student Health Survey**Y Apostolopoulos<sup>1,2</sup>, PhD, M Al Matroushi<sup>3</sup>, MD, S Thomas<sup>3</sup>, MS, G Wajid<sup>4</sup>, PhD<sup>1</sup>Natural Science & Public Health, Zayed University, Abu Dhabi, UAE<sup>2</sup>Emory University School of Medicine, Atlanta, Georgia, USA<sup>3</sup>Central Department of School Health, Ministry of Health, Abu Dhabi, UAE<sup>4</sup>Department of Curative Medicine, Ministry of Health, Dubai, UAE**Background:** Following western epidemiologic and nutrition transition trajectories, obesity-associated comorbidities have reached epidemic rates across the Arab world. Given that over 70% of obese children become obese adults, this paper aims to delineate baseline protective and risk factors for overweight and obesity among Emirati youth.**Methods:** A representative sample of 4,114 students (7<sup>th</sup>-10<sup>th</sup> grades) from Abu Dhabi was selected for participation in the Global School-Based Student Health Survey. Participants answered questions on diet and nutrition, physical activity, health protective factors, sociodemographics, and psychosocial domains.**Results:** Preliminary analysis indicates alarming signs for boys and girls in the Abu Dhabi Emirate. With regard to diet/nutrition, and irrespective of gender, about 35% of the adolescents are overweight or at risk for becoming overweight, 17% consume fastfood three or more times a week, and over 18% eat high-fat foods two or more times a day. On the other hand, only about 20% participate regularly in efficient physical activity, nearly 36% spend three or more hours daily in sedentary leisure activities, and almost 78% use a means of transportation to go to school. Ongoing multivariate analysis focuses on important correlates of risky dietary behaviors and inactivity for youth, such as awareness/knowledge of health risks, parental monitoring and feelings of loneliness, along with sociodemographics such as age, gender, ethnicity, public or private school, and SES.**Conclusions:** The delineation of correlates that explain dietary and physical activity trends will be invaluable to understanding risky behavioral patterns of Abu Dhabi youth and for evaluating school health promotion programs.

## T5:PS.104

**Childhood health problems associated with overweight: the PIAMA birth cohort study**Wijga, AH<sup>1</sup>, Scholtens, S<sup>2</sup>, Bemelmans, WJE<sup>1</sup>, de Jongste, JC<sup>3</sup>, Kerkhof, M<sup>4</sup>, Schipper, M<sup>4</sup>, Sanders, EA<sup>4</sup>, Gerritsen, J<sup>4</sup>, Brunekreef, B<sup>2</sup>, Smit, HA<sup>1,5</sup><sup>1</sup> Centre for Prevention and Health Services Research, National Institute for Public Health and the Environment, Bilthoven, The Netherlands<sup>2</sup> Institute for Risk Assessment Sciences, Utrecht University, Utrecht, The Netherlands<sup>3</sup> Department of Pediatrics, Division of Respiratory Medicine, Erasmus MC – Sophia, Rotterdam, The Netherlands<sup>4</sup> Department of Epidemiology and Bioinformatics, University of Groningen, Groningen, the Netherlands<sup>5</sup> Expertise Centre for Methodology and Information Services, National Institute for Public Health and the Environment, Bilthoven, The Netherlands<sup>6</sup> Department of Pediatric Immunology & Infectious Diseases, Wilhelmina Children's Hospital, University Medical Centre Utrecht, Utrecht, The Netherlands<sup>7</sup> Beatrix Children's Hospital, University Medical Centre Groningen, University of Groningen, The Netherlands<sup>8</sup> Julius Centre for Health Sciences and Primary Care, University Medical Centre Utrecht, Utrecht, The Netherlands

The aim of this study was to investigate childhood health problems associated with overweight.

Data were used of 3960 8-year-old children, participating in the Dutch PIAMA birth cohort study. Weight and height, measured by the investigators, were used to define weight status (underweight, normal weight, moderate overweight, obesity). The following parental reported outcomes were studied: a general health index, GP visits, school absenteeism due to illness, health-related functional limitations, doctor diagnosed respiratory infections and use of antibiotics. Multivariate regression modeling was used to assess the associations.

Obesity was significantly associated with poorer general health, more GP visits, more school absenteeism, more health-related limitations, a higher incidence of bronchitis and more frequent use of antibiotics (adjusted odds ratios around 2.0 for most outcomes). The associations with flu/serious cold, ear infection and throat infection were also positive, but not statistically significant. For moderate overweight, the associations tended to be in the same direction, but they were weaker and for most outcomes not statistically significant. Underweight was associated with poorer general health and more health related limitations, but these associations seemed to be largely explained by parental perception and only to a lesser extent by actual illness.

We conclude that childhood obesity is not merely a risk factor for disease in adulthood, but causes adverse health effects already in childhood. The high prevalence of the outcomes studied implies a high burden of disease in terms of absolute numbers of sick children.

**Funding:** This work was supported by the Netherlands Organisation for Health Research and Development, the Netherlands Asthma Foundation and the Netherlands Ministry of Health, Welfare and Sport.

## T5:PS.106

**Associations between obesity and dyslipidemia: no evidence of ethnic differences**Federica Barzi<sup>1</sup> on behalf of the Obesity in Asia Collaboration.<sup>1</sup>The George Institute for International Health, The University of Sydney, Sydney, Australia.**Background:** To compare the performance of body mass index (BMI) against waist circumference (WC), waist:hip ratio (WHR) and waist:height ratio (WHTR) in the discrimination of dyslipidemia in ethnically diverse populations.**Methods:** 166,000 individuals (52% women) from 16 cross-sectional studies part of the Obesity in Asia Collaboration. Areas under the receiver operating characteristic curves (AUC) were derived to assess the ability of each anthropometric variable to discriminate those individuals with and without dyslipidemia and to estimate optimal cut points. Dyslipidemia was classified as either fasting triglycerides  $\geq 2.3$  mmol/L and/or total cholesterol  $\geq 6.2$  mmol/L or between 5.2 and 6.2 mmol/L with a total to high density lipoprotein-cholesterol ratio  $> 5.0$ .**Results:** Measures of central obesity tended to be more strongly associated with dyslipidemia compared with BMI and the strength of the associations were similar in Asians compared with non-Asians. AUCs ranged from 0.64, for BMI and WHR, to 0.70, for WC and WHTR, indicating that there was little difference between the four measures of overweight at discriminating dyslipidemia. The optimal cut-points for the discrimination of dyslipidemia for each of the anthropometric variables varied by sex and ethnicity but were generally lower among Asians compared with non-Asians. For example, WC cut-points for Asian men and women were 83 and 78 cm respectively and the corresponding figures for non-Asians were 92 and 82 cm.**Conclusion:** There was no evidence to support ethnic differences in the strength of the association between measures of overweight with dyslipidemia.

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**T5:PS.107**

**Normal weight obesity syndrome: higher prevalence in rheumatic patients than working population**

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**Introduction:** Obesity is associated to metabolic alterations, an independent factor risk for cardiovascular diseases (CVD). Lorenzo et al. defined Normal-Weight Obesity (NWO) Syndrome, for women with normal body mass index (BMI<25Kg/m<sup>2</sup>), but excess fat mass (FM>=30%).

**Objective:**Evaluate differences of NWO syndrome and CVD risk factors between rheumatic women (RW) and healthy women(HW).

**Methods:**We analysed anthropometric variables, body composition by bioelectrical-impedance, hypertension and CVD risk defined by abdominal perimeter (AP≥88cm) in 779 women. RW included 584, with 51.9±15.9years, 117(20.0%) Rheumatoid Arthritis(RA), 97(16.6%) Osteoarthritis(OA), 59(10.1%) Spondyloarthropathy(SpA) and 28(4.8%) Osteoporosis(OP), were compared to (n=195) aged 38.0±8.4years. NWO group was compared to non-obese women and NWO RW to NWO HW (54.3±13.8vs.40.2±8.6years; p<0.0005).

**Results:**RW had higher BMI, FM, AP, hypertension and lower total body water (TBW) than HW(p<0.05). The NWO group (n=215) showed higher BMI, AP, hypertension and altered body composition compared with non-obese women(p<0.05). NWO syndrome affected 33.3% RA, 32.1% OP, 32.0% OA and 25.0% SpA's. NWO RW (n=179, 30.7%) presented higher FM (32.8±2.2%vs.31.8±1.3; p=0.012), significant TBW deficit (58.7%vs.37.8%; p=0.020) and higher prevalence of hypertension (44.4%vs.2.8%; p<0.0005) than NWO HW (n=36, 18.5%). AP risk factor did not differ between the NWO groups (74.3%vs.73.0%).

**Conclusion:**NWO syndrome affects a significant group of RW, without differences among most frequent rheumatic diseases, and when compared to NWO HW, we verified a higher prevalence of hypertension and TBW deficit. The presence of metabolic variables alterations in a normal BMI group, reveals a potential risk for developing CVD associated to obesity.

**T5:PS.109**

**Conicity index of the adult population of Santos city, Brazil**

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Central body fat is an important marker of chronic diseases. The waist-to-rip ratio and abdominal circumference are utilized like predictors of risk because are strongly associated with visceral fat. However, these techniques not consider the height of the subject, this fact can produce bias in the results interpretation. Conicity index (CI) is another anthropometric measure having potential for predicting fat distribution and disease risk. This index is based upon the idea that the shape of the human body changes from that of a cylinder to that of a "double cone" with accumulation of fat around the waist. It has an expected theoretical range (1.0 to 1.73). A study conducted in Brazil (Pitanga & Lessa, 2004) showed that the best cutoff points to high risk are 1.25 for males and 1.18 for females. Thus, the aim of this study was to verify the prevalence of adult subjects of Santos city that presented values above cutoff points. A cross-sectional sample comprised 606 adults (296 males and 310 females) between 20-69.9 years old, randomly selected. The results showed that 41.2% of men and 28.4% of women presented CI above cutoff points. The table below show stratifies results by nutritional status:

Risk	Male		Female	
	Low	High	Low	High
Normal	80.5%	19.5%	89.6%	10.4%
Overweight	58.3%	41.7%	65.9%	34.1%
Obesity	14.3%	85.7%	31.3%	68.7%

The prevalence of abdominal obesity is high in the population of this study, including subjects in overweight and normal weight, indicating high risk for chronic disease in not obese individuals too.

**T5:PS.108**

**Structured, Interdisciplinary and Cross-sectorial Offer for Overweight Infants and Their Families in Ringkjøbing Community**

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The prevalence of overweight and obesity among children in Denmark is rising<sup>2</sup>, 7% of the girls and 5.5% of the boys between 5-7 years are overweight. The prevalence of obesity in this age group is 2 % for the girls and 1 % for the boys.<sup>3</sup> The reason for this increase is unknown, but food- and activity habits are assumed to play a major role. There is some evidence that the food- and activity habits of the children are formed early in life and are brought into adulthood<sup>4</sup> exactly as there seems to be a connection between the child's overweight from 3 years of age and overweight in adulthood<sup>5</sup>.

The purpose of this project is to develop, implement and evaluate a method, which is structured, interdisciplinary and cross sectorial, which can be used in treatment on overweight children and their families in Ringkjøbing community.

All children in Ringkjøbing community, who are found to be overweight based on age adjusted BMI<sup>6</sup> at the public health examine at the age 3-, 4- and 5 years by their own doctors are offered to participate in the project. The families are meeting with the practitioner team (dietician, physiotherapist, family consultant) in the Nutrition unit 3 weeks after receiving the reference.

After 3 consultations (6-9 month from start) the children and theirs family have had change their food- and activity habits. The childrens bmi z-score is the same (73% of the children have a lower bmi and 27% have the same bmi or higher) as start the intervention. Next result: January 2008.

<sup>2</sup> Wedderkopp, Niels et.al. Ugeskrift for Læger 2001; 163 side 2907-2912

<sup>3</sup> Ernæringsrådet 2002: Den danske fedmeepidemi side 20

<sup>4</sup> Sundhedsstyrelsen 2003: Oplæg til national handlingsplan mod svær overvægt side 25

<sup>5</sup> Mikkilä V et. al.:Consistent dietary patterns identified from childhood to adulthood, 2005

<sup>6</sup> M.F. Rolland-Cachera et. al.: Adiposity rebound in children: a simple indicator for predicting obesity, Am. J. 1984

<sup>7</sup> Effer Burnait, Walter m.fl. 2002:

Alder	boys BMI (kg/m <sup>2</sup> )	Girls BMI (kg/m <sup>2</sup> )
3 år	17,9	17,6
4 år	17,6	17,3
5 år	17,4	17,1

If BMI corresponds to the same value or greater than shown in the table the child is considered overweight. The values in the tables correspond to a BMI of 25 kg/m<sup>2</sup>, if the child had been older than 18 years old.

**T5:PS.110**

**Weight perceptions, diet and exercise practices, and percentage body fat in adolescent girls from five ethnic groups.**

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**Aim:** To compare girls' perceptions of body size with their engagement in dietary or exercise practices across different ethnic and body fat groups.

**Methods:** A total of 954 girls (37.7% European, 21.6% Pacific Island, 15.8% East Asian, 10.2% Maori, 9.6% South Asian, 5.0% Other) aged 11-15 years participated in this study. Percentage body fat (%BF) was obtained using hand-to-foot bioelectrical impedance analysis. Body size perceptions, diet/exercise behaviours, and pubertal status were assessed by questionnaire.

**Results:** Overall, 23.4% of participants considered themselves to be 'overweight', while 68.6% and 8.0% were self-diagnosed as 'normal weight' and 'underweight', respectively. However, nearly half of the girls tested were trying to lose weight, suggesting a lack of accordance between weight perceptions and weight control practices in this age group. The proportion of girls who reported exercising in the last 30 days for weight maintenance/loss (50.2%) was significantly higher than those who modified their diet (28.2%; P < 0.05). While the probability of dieting and exercise practices was highest in girls self-diagnosed as overweight, only 55.9% of girls with a %BF < 85<sup>th</sup> percentile correctly identified themselves as overweight. The interactions among %BF, overweight perceptions, and weight control practices were relatively consistent across ethnicities.

**Conclusions:** Weight control practices are relatively common among adolescent girls who perceive themselves to be overweight, regardless of ethnic background. Nonetheless, a large proportion of girls with excess %BF did not recognise the condition, suggesting that initiatives for assisting girls to identify the indicators of overweight may be beneficial.

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## T5:PS.111

**High-energy diet in combination with sedentary lifestyle makes healthy young individuals feel resignation.**

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Consumption of fast food has increased during the past twenty years, and a sedentary lifestyle has become more common. These are two major risk factors associated with the increase of overweight and obesity, which are found in all ages around the world. The aim of this study was to describe the lifeworld experience while increasing energy intake and simultaneously adopting a sedentary lifestyle for four weeks in healthy, normal-weight individuals. Twelve men and six women (median age 23, range 21-44 years) were prescribed a doubled energy intake in parallel with a maximum allowance of physical activity of 5000 steps per day. After completing this intervention the participants were interviewed and asked to describe their lifeworld experience during the prior four weeks. A phenomenological approach was used. Analyses of the transcripts were performed according to Giorgi. The essence of the phenomenon was resignation, emerging from five themes: Changed Body Shape, Togetherness, Management, Tiredness and Physical Impact. In conclusion, the high-energy diet and sedentary lifestyle influenced participants to experience resignation in their lifeworld. In spite of both physical and mental impact of the intervention, the participants felt indifferent and apathetic.

## T5:PS.113

**Recent trends in childhood overweight in France**

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**Background:** France is not spared by the development of adiposity, particularly in its child population, where overweight (OW) rates have risen faster than in adults during the last three decades.

**Objective:** 1) To assess the current prevalence of childhood OW in France based on the recent national INCA-2 survey; 2) to compare these rates with the previous estimations from the INCA-1 study (1998-99); 3) to assess the relationship between OW and socio-economic status (SES).

**Design and subjects:** Representative sample of French children aged 3-17 y ( $n=1455$ ) from the 2006 cross-sectional French INCA-2 food consumption survey.

**Measurements:** Weight and height were measured, food consumption was collected using a 7-day food record, physical activity and SES were reported by answering questionnaires.

**Results:** According to the IOTF definition, 14.1% [11.1-17.1], 15.3% [11.8-18.8], and 11.9% [8.7-15.1] of the children aged 3-10 y, 11-14 y, and 15-17 y, respectively, are OW (including obese). Overweight and SES are inversely associated ( $P<0.01$ ). In the same age ranges of the INCA-1 study performed seven years ago, OW rates were respectively equal to: 16.9% [14.1-19.9], 11.7% [8.4-15.6], and 14.3% [8.2-22.5]. However, although these figures show that childhood OW rates are undergoing their first overall stabilisation in France, trends are not the same among all SES categories.

**Conclusion:** The periodic monitoring at the population scale of both OW and its main determinants through the INCA surveys ambitions to explore which health behaviours are associated with the different trends in OW prevalence among SES categories, and to adapt preventive actions accordingly.

**Key words:** Child obesity / France / Trend / Socio-economic status

## T5:PS.112

**The Secular Trend of Body Mass Index and the Incidence of Overweight and Obesity in Young Greek Men. Correlation to Socio-Demographic characteristics**

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**Objective:** To examine the secular trend of Body Mass Index (BMI) and the prevalence of overweight and obesity in young Greek men

**Research Methods and Procedures:** This cross-sectional study was performed from May 2006 to January 2007 and was based on anthropometric data collected from 3635 conscripts of the Greek Army, aged 19-26 years. BMI was correlated to socio-demographic characteristics, i.e. the level of education and the place of residence (urban or rural) of the subjects. Overweight and obesity were defined according to the WHO classification. The results of this study were compared with similar studies that were performed in the years 1969 and 1990.

**Results:** Mean BMI ( $\pm$ SD) of the conscripts of the present study was 24.7 (4.2), whereas in the year 1969 it was 23.8 (1.4) kg/m<sup>2</sup>,  $p<0.0001$  and in 1990 it was 23.8 (2.9) kg/m<sup>2</sup>,  $p<0.0001$ . Prevalence of overweight in the present study was 28.7% whereas that of obesity was 10.3%. Overweight and obesity showed no correlation with the place of residence, however there was a significant positive correlation between overweight and higher education, and obesity and low educational level.

**Conclusions:** Our study shows a positive secular trend for BMI in Greek conscripts in the last 16 years. It also shows a high prevalence of overweight and obesity among young Greek men.

## T5:PS.114

**The development of a national healthy eating programme for primary schools in Ireland**

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The development of a Healthy Eating Programme from initial pilot study to national roll-out is described. The pilot study evaluated the effectiveness of a programme (the Food Dudes Programme) in bringing about large and long-lasting increases in primary school children's consumption of fruit and vegetables in Ireland, where school meals are not provided and children bring food to schools in lunchboxes. The extension of the programme to 99 primary schools followed by national roll-out is then described. In the pilot study (two schools,  $n=400$ ), the experimental school participated in the Healthy Eating Programme, which included video-based peer-modelling (the Food Dudes) and rewards for eating fruit and vegetables. In both experimental and control schools, provision and consumption of fruit and vegetables in children's lunchboxes was assessed at baseline, during intervention, and at 12-month follow-up. Results indicated that 12 months following the Food Dude intervention, children in the experimental school brought in and consumed significantly more fruit and vegetables compared to the control school ( $p < 0.001$ ). In the subsequent roll-out of the intervention, questionnaire data on consumption were collected from parents and teachers in 75 schools. These indicated increased provision and consumption of fruit and vegetables, high enjoyment of the programme, and excellent buy-in from teachers and parents. It may be concluded that the Irish Schools Programme is highly effective in changing children's consumption of fruit and vegetables.

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## T5:PS.115

**Association study between FTO and obesity-related phenotypes in French population-based samples**

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We investigated the association between the rs9939609 polymorphism in the FTO (fat-mass and obesity-associated) gene and obesity- and type 2 diabetes-related phenotypes in two MONICA population-based studies from the south (n=1169) or the north (n=1149) of France. In the combined sample (n=2318), there were 373 subjects with a BMI $\geq$ 30 and 1945 subjects with a BMI $<$ 30 kg/m<sup>2</sup>. In the combined MONICA sample, subjects bearing the TA or AA genotype for rs9939609 had an increased risk of obesity (BMI $\geq$ 30 kg/m<sup>2</sup>) (adjusted odds ratio [95% confidence interval]=1.30 [1.01-1.66], P=0.040) compared with TT subjects. The risk of severe obesity (BMI $\geq$ 35 kg/m<sup>2</sup>, n=113) was 1.62 [1.04-2.54], P=0.034 for the subjects carrying the TA or AA genotype compared with TT subjects. Moreover, TA or AA subjects had higher body mass index (P=0.05) and higher systolic (P=0.037) or diastolic (P=0.005) blood pressure than TT subjects, in a A-allele dose dependent manner. Finally, the AA genotype of rs9939609 was associated with an increased risk of type 2 diabetes (OR=1.44 [1.00-2.08] P=0.05, 203 subjects with and 1773 subjects without type 2 diabetes), independently of fat mass. In conclusion, the A allele of the FTO rs9939609 polymorphism was associated with an increased risk of obesity and type 2 diabetes in the French MONICA samples.

## T5:PS.117

**Identifying the key determinants of childhood obesity in Leeds using spatial analysis**

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**Background:** Environmental factors are a likely rationale for the escalation in obesity prevalence seen in recent years. The aim of this paper is to explore whether variations in the obesogenic environment exist across the neighbourhoods of a major UK city.

**Method:** Height and weight data for 3-13 year olds was used to calculate body mass index (standardised using the British reference dataset; obesity > 98<sup>th</sup> centile). Micro-level obesogenic covariates were simulated from the Health Survey for England (2002) and the Expenditure and Food Survey (2005). Univariate geographically weighted regression analyses were undertaken to identify the covariates with the strongest global relationships with obesity, any non-stationarity in the relationships, and the key local determinants of obesity.

**Results:** There is considerable variation in obesity and obesogenic variables across Leeds. The covariates with the strongest global relationships with obesity were supermarket/leisure facilities' access, public transport, fruit and vegetable consumption, sedentary behaviour, household income and urbanisation. These covariates also showed a non-stationary relationship with obesity, meaning that the same stimulus provokes a different response in different parts of Leeds. The key local determinants of obesity were food expenditure, television ownership/Internet access, neighbourhood safety, school meals and children's physical activity levels.

**Discussion:** This paper shows that childhood obesity, and its determinants, are not uniform across Leeds, highlighting those areas where the key determinants are different locally to globally. It supports the existence of "obesogenic environments": features of the local environment may affect childhood obesity by changing health behaviours. This local level analysis is novel in respect to obesity studies.

**Funding:** The research relating to this abstract was funded by the ESRC and MRC.

## T5:PS.116

**Nutritional status of teachers in the project "Educational strategy in nutrition and physical activity in elementary schools in Mexico"**

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The aim of the project "Educational strategy in nutrition and physical activity in elementary schools in Mexico" (Fundación Wal Mart México, Ogali, PCI) is to increase fruit and vegetable intake and regular physical activity in children as part of a healthy lifestyle. For that purpose a program was designed for each school grade (from 1<sup>st</sup> to 6<sup>th</sup> grades), with at least one weekly session in the classroom throughout the school-year, training for the teachers, didactic material and extracurricular activities carried out by volunteers. The study included a basic nutritional diagnosis of 327 teachers, ages 21 to 60 (24.6% males and 75.4% females), of 21 public schools of the north (Comarca Lagunera), center (Federal District and State of Mexico) and south (Tabasco) of Mexico that attended the training sessions and that gave their consent for the evaluation. Weight and stature measurements were carried out by standardized nutritionists using Lohman's techniques. Seventy six percent of teachers had overweight or obesity (BMI  $\geq$  25), 59% had central obesity (waist circumference > 88 cm in females and >102 cm in males), and 6% had high glycemia (> 126 mg/dL). The media consumption of vegetables and fruits was 2.2 cups a day, moderate physical activity reported was 20 mins/day, and intensive physical activity was 9 mins/day. These results support the need for the development of effective strategies to improve nutritional status of teachers. *Financed by Fundación Wal Mart México AC.*

## T5:PS.118

**Consumption of lean fish increases weight loss in young overweight and obese adults on an energy reduced diet for eight-weeks.**

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**Background:** In a cross-European study it was recently shown that consumption of lean fish stimulates weight loss in men and has other positive health effects.

**Objective:** To investigate whether lean fish (cod) consumption increases weight loss and diminishes cardiovascular risk in a dose dependent manner during an eight-week energy restriction in young overweight and obese, but otherwise apparently healthy adults.

**Design:** In this dietary intervention 126 subjects (20-40 years, BMI 27.5-32.5 kg/m<sup>2</sup>) were grouped to energy-restricted diets (-30%) prescribing identical macronutrient composition but different amounts of cod: group 1=control group, no seafood; group 2=150g cod 3x/week; and group 3=150g cod 5x/week. Anthropometric measurements and cardiovascular risk factors were assessed at baseline and endpoint.

**Results:** Body weight decreased after eight weeks (5.0 $\pm$ 2.9kg, P<0.001), also waist circumference (5.0 $\pm$ 3.2cm, P<0.001), BMI (1.65 $\pm$ 0.95kg, P<0.001), systolic (3.4 $\pm$ 8.9mmHg, P=0.001) and diastolic blood pressure (2.4 $\pm$ 6.9mmHg, P<0.001), triglycerides (1.26 $\pm$ 0.567mmol/L, P=0.030) and insulin (1.21 $\pm$ 5.31mU/L, P=0.025). The prevalence of metabolic syndrome dropped from 29 to 21%. According to a multivariate analysis weight loss was 1.7 kg greater among subjects consuming 150g 5x/week compared to the control group (P<0.015). The trend analysis supported a dose-response relationship between cod consumption and weight loss (P<0.001), but changes of other measured cardiovascular risk factors were similar between the groups.

**Conclusions:** A dose-response relationship between cod consumption and weight loss during an eight-week energy restriction is found and 5x150 g cod/week results in 1.7 kg greater weight loss in young overweight or obese adults than a isocaloric diet without seafood.

**Funding:** The present study was funded by the Icelandic Research fund AVS, contract no R 048-05.

## T5:PS.119

**Evolution of the prevalence of obesity in a cohort of children and teenagers in the French part of Switzerland**

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Information on the prevalence of Obesity in children and adolescents is scanty in Switzerland. The objective was to measure the prevalence of overweight and obese children (from 5 to 16 years) attending public schools in the City of Lausanne. The cohort was analyzed over a 10-year interval: children born in 1980 were compared to those born in 1990. Cole's cut off points was used in order to allow international comparisons. Trained school paramedics measured body weight & height repeatedly approximately every year in the initial cohort.

Age range :	5.0 to 11.5 y	11.5 à 16 y	5.00 to 11.5 y	11.5 to 16 y
Girls	No of overweight children (n of measurements)		Mean prevalence (%)	
1980	330 (2334)	188 (1346)	14.1%	14.0%
1990	160 (954)	76 (401)	16,8%	19,0%
Girls	No of obese children (n of measurements)		Mean prevalence (%)	
1980	63 (2334)	38 (1346)	2.7%	2.8%
1990	35 (954)	10 (401)	3,7%	2,5%
Boys	No of overweight children (n of measurements)		Mean prevalence (%)	
1980	312 (2331)	249 (1412)	13.4%	17.6%
1990	145 (1242)	93 (574)	11,7%	16,2%
Boys	No of obese children (n of measurements))		Mean prevalence (%)	
1980	40 (2331)	32 (1412)	1.7%	2.3%
1990	44 (1242)	28 (574)	3,5%	4,9%

We observed an increase of variable magnitude in the prevalence of overweight and obesity in children, which is gender dependent: the prevalence of obesity, although initially low as compared to other European countries, has doubled over 10 years in boys.

## T5:PS.121

**Predictors of health-related quality of life in overweight and normal-weight children**Vögele, C<sup>1</sup>, Brewing, I<sup>2</sup>, Bray, D<sup>1</sup>

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Health-related quality of life (HR-QoL) has been shown in a number of recent studies to be lower in overweight and obese children compared to normal-weight controls. However, investigations of variables mediating this association are rare, although there is preliminary evidence that psychological factors play an important role. We have shown in previous studies that body dissatisfaction is associated with dieting behaviour independent of BMI. The current study used a path analytical approach in predicting HR-QoL in 8-10 year old school children. A sample of 428 children (52% girls, 23% overweight and obese) participated in a cross-sectional survey assessing BMI, body dissatisfaction and dieting behaviour. BMI was significantly associated with body dissatisfaction and dieting behaviour. Body dissatisfaction was negatively related to HR-QoL and this effect was mediated by dieting behaviour. Gender had no effect on any of these parameters. The results suggest that a negative body image and dieting behaviour mediate the relationship between BMI and poor HR-QoL. Given that these factors are established risk factors for eating disorders these results are of concern, particularly in children of such a young age.

## T5:PS.120

**The role of obesity in determining health-related quality of life in patients with Type 2 diabetes mellitus – influence of diabetes progression.**

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**Aim:** To determine the influence of obesity on life quality (HRQL) of diabetic patients with different duration of diabetes.

**Methods:** 103 female diabetic patients were examined with BMI ranging normal to morbid obesity. HRQL was assessed using SF-36 questionnaire. Spirometry, echocardiography, 6-minute walk test (6-MWT) were performed to determine possible contributors to changes in HRQL. Patients with history of MI or stroke were excluded.

**Results:** Patients without obesity (BMI <30, N = 40) had higher HRQL on physical component score scale than obese ones (PCS 39±5,4 vs. 36±6,2 points) due to the difference in physical activity (PA 57±21.9 vs. 42±22.4) and general health perception (35±15.2 vs. 27±15.3). HRQL on these scales negatively correlated with BMI, waist circumference and waist-hip ratio where correlation with waist circumference was the strongest.

PCS score correlation with these variables remained significant and became stronger in patients with duration of diabetes less than 10 years as well as differences between non-obese and obese groups increased (PCS 41±5.3 vs. 36±6.5, PA 63±23.2 vs. 41±22.4). In duration of diabetes of more than 10 years there was no difference between non-obese and obese groups and no significant correlation of HRQL with obesity.

Physical HRQL correlated with 6-MWT distance, severity of neuropathy and nephropathy, severity of CHF and stable angina, duration of hypertension and some spirometric and echocardiographic measurements.

**Conclusion:** Obesity leads to deterioration of HRQL in patients with diabetes decreasing physical activity component. Its influence is the greatest in short duration of diabetes and diminishes with the progression of diabetes.

## T5:PS.122

**WHO European Childhood Obesity Surveillance Initiative**Wijnhoven TMA<sup>1</sup>, Branca F<sup>1</sup>

For the Surveillance Initiative Investigators Team

<sup>1</sup> World Health Organization Regional Office for Europe, Nutrition and Food Security Program, Copenhagen, Denmark

The World Health Organization Regional Office for Europe is establishing a European-wide standardized childhood obesity surveillance system which will monitor the effectiveness of the policy response to the emerging obesity epidemic. The system will be designed to measure routinely the trends in overweight and obesity in a national sample of primary schoolchildren aged 6-9 years. The aim is to have a correct understanding of the epidemic's progress in this population group and to allow intercountry comparisons within the WHO European Region.

The first data collection round is planned to take place during the school year 2007/2008 in some countries in the Region and thereafter repeated at a two-year-interval. Core measurements will be body weight and body height; optional will be waist- and hip circumferences as well as associated comorbidities, dietary intake and physical activity/inactivity patterns. The anthropometric measurements will be done in schools by examiners who will be trained and standardized.

Although each country is free to develop a system that fits their local circumstances it is imperative that data are collected according to a common agreed protocol and that they contain the stipulated core elements. The system is designed as simple as possible and should not demand a major investment of public resources. There is no intention to replace existing country's health, anthropometry and dietary surveillance systems already ongoing or in the planning, on the contrary, the system should if possible be integrated with them.

## T5:PS.123

## Impact of whole grain breakfast cereals on satiety and short-term food intake

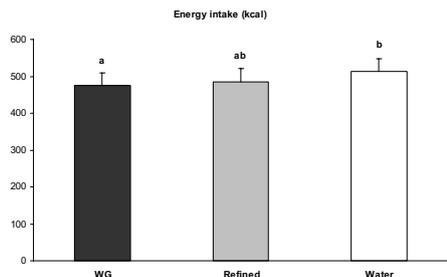
About Samra, R, Brienza, D, Grathwohl, D, and Green, H

Nestlé Research Centre, Lausanne, Switzerland

**Background:** Whole grain foods are associated with lower risk of obesity possibly through an effect on appetite. Therefore, we investigated the effect of whole grain (WG) breakfast cereals on satiety and short-term food intake.

**Methods:** In a randomized crossover design, two commercially available chocolate-flavored WG (32% breakfast cereals (WGA and WGB, 30g), a refined chocolate-flavored breakfast cereal (0% WG, 30g) and a water control (400ml) were administered to thirty-two healthy adults (12 men) after an overnight fast. The isocaloric cereals were served with 125 ml of milk (2.5 % fat) and 250ml water. Subjective feelings of satiety were measured using validated visual analogue scales at 15min intervals before and after eating. *Ad libitum* food intake was measured 2 hrs later. Satiety was assessed with a composite score for satiety (CSS), averaging fullness and the inverse of hunger, desire to eat and prospective consumption.

**Results:** All cereals resulted in higher satiety ratings compared with water (Mean CSS  $\pm$  SEM, mm-min: over 2hrs, 6535  $\pm$  474; 6883  $\pm$  451; 6529  $\pm$  444; 3545  $\pm$  319 respectively,  $P < 0.0001$ ). There was no difference in food intake between refined cereals and water, however, energy intake was lower after WGA and WGB cereals combined (Mean  $\pm$  SEM, kcal: 483.0  $\pm$  37.3; 465.3  $\pm$  35.5 respectively) compared with water (513.5  $\pm$  34.1,  $P = 0.02$ ).



**Conclusions:** Consumption of 32% WG breakfast cereals is associated with better energy compensation 2hrs later compared with refined cereal, helping explain the protective effect of whole grains on obesity.

Research was co-funded by Nestec and Cereal Partners Worldwide.

## T5:PS.126

## Nutritional evaluation and quality of life in rheumatic patients

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Portuguese Institute Of Rheumatology

**Introduction:** Improving quality of life and reducing disability are identified as major priorities in the treatment of the rheumatic patients.

**Objective:** To correlate quality of life and body composition in rheumatic patients.

**Methods:** The IPR inpatients were interviewed to fill in the SF-36 (Medical Outcomes Study 36 – Item Short-Form Health Survey) and the HAQ-DI (Health Assessment Questionnaire Disability Index), between July and November of 2007. Anthropometric variables and body composition by bioimpedance (Tanita BC-418) were measured in 57 patients, 5(8.8%) men and 52(91.2%) women with average age of 61,8 $\pm$ 14,0 years.

**Results:** Overweight patients presented higher average scores in SF-36 than normal BMI individuals (50,8 $\pm$ 28,2 vs. 26,8 $\pm$ 15,1;  $p=0.002$ ); patients with fat mass excess revealed significantly higher scores compared to unaltered body composition patients (94,0 $\pm$ 8,5 vs. 42,4 $\pm$ 26,1;  $p=0.008$ ). Significant correlations were found in SF-36 dimensions: BMI and physical functioning ( $r=0,382$ ;  $p=0,003$ ); total body water and vitality ( $r=-0,373$ ;  $p=0,008$ ). HAQ-DI scores were negatively associated to free fat mass ( $r=-0,285$ ;  $p=0,035$ ).

**Conclusion:** Quality of life analysed by SF-36 was lower in overweight patients and in altered body composition individuals. Among evaluated dimensions, physical functioning and vitality were associated to nutritional parameters, confirming the importance of a healthy nutritional status, in what concerns to prevention and obesity treatment, specially in patients with compromised motor activity, in most rheumatic diseases.

## T5:PS.125

## The prevalence of obesity among children in Czech Republic and Slovakia and the effect on hip, knee and foot discomfort

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<sup>1</sup> Tomas Bata University in Zlín, Czech Republic

**Introduction:** This study is part of an international research effort by various research groups from Australia, Czechoslovakia, Germany, and Switzerland (see acknowledgements).

The prevalence of foot disorders and other orthopaedic problems among young people raise sharply<sup>1</sup>. The reason for this situation is widely unknown Anthropometrics of the children and their feet changed sizeably over the last decades. In this context the number of obese children is increased worldwide. The aim of this study was to assess the prevalence of obesity in children in the Czech Republic and Slovakia and to analyse the frequency of foot, knee and back discomfort in obese children.

**Method:** 1000 children (50 % girls, 50 % boys), aged from 6 to 15, of different Czech and Slovak cities were evaluated using a questionnaire about foot, knee and back pain<sup>2</sup>. Additionally the children's body weight and height were examined Data were analysed using SPSS15.0 for Windows.

**Results:** The occurrence of obesity is significantly higher in large cities. Surprisingly, regarding the frequency of orthopaedic problems, undernourished children were complaining more often, about pain in their back and feet than obese or normal weight children. On the other hand, in these children knee pain appeared more often. Considering the feet, the most frequent troubles were in the area of plantar heel and medial longitudinal arch as well as on the lateral side of the ankle.

**Conclusion:** The results show an effect of BMI on the frequency of discomfort in the children's feet, knee, and back. These results can help to develop programs for obese children to avoid further problems.

However, it is not clear, whether the obesity is a reason or consequence of orthopaedic ailment. Therefore, further research is warranted.

**Acknowledgements:** The design of this study resulted from the International Study on Foot Function and Childhood Obesity: Stefan Grau, Peter Hlavacek, Ewald Hennig, Marlene Mauch, Bridget Munro, Jacqueline Romkes, Alex Stacoff, and Julie Steele

**References:** <sup>1</sup>Spahn et al. (2004). The prevalence of foot pain and foot deformities in adolescent. *Z Orthop Grenzgeb*, 142, 389-396.

<sup>2</sup> This questionnaire was developed in collaboration with Germany, Switzerland and Australia and is also used in these countries.

## T5:PS.127

## Should overweight and obesity criteria be modified in Rheumatoid Arthritis?

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Portuguese Institute Of Rheumatology

**Introduction:** Recent studies suggest that Body Mass Index (BMI) should be revised in patients with rheumatoid arthritis (RA)<sup>1</sup>.

**Objectives:** BMI evaluation, according to overweight and obesity classes, and new criteria recently proposed.

**Material e Methods:** Patients from Portuguese Institute of Rheumatology followed for 2 months. BMI, fat mass(FM) and abdominal perimeter(AP) were evaluated. Population composed by 511 patients with RA, 792 with osteoarthritis(OA) and a control group with 379 individuals (no rheumatologic diseases). All groups were analysed by gender, current BMI and suggested in recent studies (BMI $\cdot$ 23Kg/m<sup>2</sup>-overweight and BMI $\geq$ 28Kg/m<sup>2</sup>-obesity).

**Results:** Most men were overweight (approximately 50%) and OA men were more obese. RA and OA women were similar in overweight compared to control. In obesity, OA women were more obese than the other groups. According to new criteria for RA, we have more 16,5% overweight men and 16,2% obese women, both with alterations in body composition and AP.

**Conclusion:** RA population has a higher prevalence of overweight and obesity when compared to controls. According to proposed criteria, a higher number of RA patients have an increased cardiovascular risk disease. In the studied intervals, overweight and obesity prevalence is similar in women with RA when compared with the other two populations, which suggest that BMI redefinition could be revised to other groups

<sup>1</sup>Redefining overweight and obesity in rheumatoid arthritis patients, *Ann Rheum Dis* 2007;66:1316-132

Men	RA	OA	C
BMI23-24.9kg/m <sup>2</sup>	14	8	24
FM-16%	11	7	14
AP-94cm	3	2	0
BMI 28-29.9kg/m <sup>2</sup>	19	21	18
FM-25%	12	16	6
AP-102cm	8	11	3
Women			
BMI23-24.9kg/m <sup>2</sup>	23	54	60
FM-24%	21	45	54
AP-80cm	11	33	30
BMI 28-29.9kg/m <sup>2</sup>	69	112	15
FM-30%	63	105	14
AP-88cm	58	89	11

Men	RA	OA	C
BMI23-24.9kg/m <sup>2</sup>	14	8	24
FM-16%	11	7	14
AP-94cm	3	2	0
BMI 28-29.9kg/m <sup>2</sup>	19	21	18
FM-25%	12	16	6
AP-102cm	8	11	3
Women			
BMI23-24.9kg/m <sup>2</sup>	23	54	60
FM-24%	21	45	54
AP-80cm	11	33	30
BMI 28-29.9kg/m <sup>2</sup>	69	112	15
FM-30%	63	105	14
AP-88cm	58	89	11

Men	RA(N=85)	OA(N=100)	Control(N=70)
Average age(years)	42.7±13.6	65.1±11.5	37.5±8.0
BMI23-29.9kg/m <sup>2</sup>	42	58	45
FM-16%	39	57	45
AP-94cm	30	44	31
BMI-30kg/m <sup>2</sup>	14	30	12
FM-25%	13	29	11
AP-102cm	12	25	11
Women			
Average age(years)	60.0±12.3	63.0±11.1	38.1±8.5
BMI23-29.9kg/m <sup>2</sup>	179	292	86
FM-24%	172	279	65
AP-80cm	166	274	58
BMI-30kg/m <sup>2</sup>	124	260	24
FM-30%	120	282	23
AP-88cm	121	285	21

## T5:PS.129

## Macrosumia from the point of view of childhood obesity

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Macrosumia is associated with a high rate of obesity in children. Obesity and overweight affecting children is becoming increasingly important on a global scale. Gestational diabetes mellitus is associated with macrosumia and childhood obesity. Childhood obesity may persist into adulthood as a critical public health threat.

The aim of this large scaled investigation is to determine the incidence, risk factors, characteristic features, and perinatal outcome of the macrosumic infants. This is a prospective survey carried out on a total of 6385 newborns. All measurements were taken by the senior pediatrician. Maternal age, blood group, parity, gestational age and type of delivery were also recorded. The incidence of macrosumic births was 7.5%. Birth weight, length, head circumference, abdomen circumference, thorax circumference, weight/height, body mass index, ponderal index (mean±SE) were 4207±10g, 53.8±0.1 cm, 36.1±0.1 cm, 33.9±0.1 cm, 35.3±0.1 cm, 7.82±0.02, 14.56±0.05 kg/m<sup>2</sup>, 27.1±0.1 kg/m<sup>3</sup> respectively. Statistically significant decreases were observed in control group. No significant difference was observed between the values of females and males. Blood group A was the most frequently observed type, however, blood group O was dominant in cases with gestational diabetes mellitus. The incidence of gestational diabetes mellitus was 0.6% in control group while this value was calculated as 4.8% among macrosumic births.

Macrosumia is associated with adverse perinatal outcome, maternal/neonatal morbidity and obesity strongly associated with severe diseases leading to life-threatening events in childhood. Therefore, it is important to emphasize the management of macrosumic infants and to consider the characteristic features related to macrosumic births.

## T5:PS.128

## 'Being fat' from a child's point of view

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**Introduction:** Since the fast growing prevalence, child overweight has been studied from many different angles. The dominant notion is that child overweight is largely caused by poor diets, inactive lifestyle and genetic factors. Little research has been done from the perspective of the 'experts', the overweight children, themselves. Children also have the potential ability to negotiate their own meanings of being fat and construct their own strategies to deal with it.

**Methods:** We used purposive sampling and studied 8 children with overweight aged 8-12 years (mean BMI: 27 (range 25-31), mean age: 10 years). All children participated at a 12 months outpatient treatment program. We used an exploratory and descriptive study design and data was analysed according to qualitative data analysis to identify emergent themes. Children's experiences and perceptions of body size and their strategies were explored using semi-structured in-depth interviews, drawings and a photographic visual exercise.

**Results:** The studied overweight children experience being fat as a social problem and not as a medical or health problem. They feel stigmatised by the encountered discrimination but also because of the shame of being fat and fear of additional unacceptability. They internalise the health message that overweight is due to eating too much and therefore predominantly blame them selves for being fat. Making friends and being part of a group are extremely important themes in their daily lives and help them preserve a positive identity, to cope with the stigma of being fat and to control their body size.

## T5:PS.130

## The long term effects of controlling feeding practices

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<sup>1</sup>Loughborough University, Loughborough, United Kingdom; <sup>2</sup>Appalachian State University, Boone, North Carolina, United States.

**Background:** Controlling feeding practices can predict children's food preferences, behavioural responses to foods, and weight gain (Farrow & Blissett, 2006; Birch et al., 2003). Feeding practices which are forceful have also been shown to predict food refusal in adulthood (Batsell et al., 2002), however, there is a dearth of research exploring the impact of recollections of other controlling feeding practices upon adults eating practices. The aims of this study were to establish whether students' and their parents' recollections of parental use of controlling feeding practices during childhood predict present students' eating habits and weight.

**Method:** 102 students and their parents completed questionnaires assessing their recollections of childhood feeding practices, Body Mass Index (BMI), and present eating styles.

**Results:** Parents' and students' recollections of controlling feeding practices were significantly, positively correlated. Parental reports of using more restriction were significantly positively correlated with students' reports of external eating, emotional eating, and negatively with their intuitive eating. Students' recollections of experiencing more monitoring and restriction during childhood were negatively correlated with their present intuitive eating. Students' and parents' recollections of feeding practices were not significantly correlated with students' present BMI.

**Summary:** Although the relationships differ when using parent and child report, both parents' and students' recollections of child exposure to controlling feeding practices are associated with students reports of eating practices as adults. These findings suggest that feeding practices used by parents may have long-term influences on eating behaviour, particularly self-regulation, in their children.

## T5:PS.131

**Obesity prevalence and dietary intake in public and private primary schools in Greece**Hassapidou, M<sup>1</sup>, Tzotzas, T<sup>2</sup>, Papadopoulou, SK<sup>1</sup>, Kaklamanos, I<sup>1</sup>, Flouraki, G<sup>1</sup><sup>1</sup>Department of Nutrition and Dietetics, TEI Thessaloniki, Greece; <sup>2</sup>Hellenic Medical Association for Obesity, Greece

**Introduction:** Obesity has taken epidemic dimensions even in childhood. The aim of this study was to assess obesity prevalence and dietary intake in schoolchildren in public and private primary schools in Greece and to examine the potential differences in anthropometric and dietary data.

**Methodology:** A total of 580 children aged 8-12y, from public schools (124 girls and 125 boys), and private schools (151 girls and 180 boys) randomly selected, participated in the study. Anthropometric measurements (weight, height, waist and hip circumferences and 5 skinfolds) were obtained from all children. Body fat was estimated according to Slaughter et al. equations (1988). Cole et al (2000) criteria were used for BMI classification. Dietary intake was assessed using 24-hour recall and weekly food frequency questionnaire. Energy expenditure was also assessed using a validated questionnaire.

**Results:** According to the results, a higher prevalence of overweight and obesity was found in public primary schools compared to private ones. In public schools: 28.0% of the boys and 22.4% of the girls were overweight and a further 12.8% of boys and 12.1% of girls were obese versus private schools: 26% of the boys and 21.2% of the girls were overweight and 5.3% of the boys and 5.3% of the girls were obese. Body fat percentage was significantly lower for girls from private schools, 20.47±7.96, than for girls from public schools, 23.59±8.06 ( $p<0.001$ ). WHR was significantly lower for girls from private schools (0.80±0.06) compared to girls from public schools (0.82±0.05),  $p<0.05$ . There were no statistically significant differences in energy or nutrient intakes between children of public and private schools, but children in private schools had a higher energy expenditure (spent more hours in sports).

**Conclusion:** In conclusion, the prevalence of obesity was found lower in children of private schools in Greece that can be attributed to their higher socio-economic status. Effective intervention programs for childhood obesity should take this factor into account.

## T5:PS.133

**The long-term trend of obesity in Finnish adults**Männistö, S<sup>1</sup>, Vartiainen, E<sup>1</sup>, Lahti-Koski, M<sup>1,2</sup>, Peltonen, M<sup>1</sup>, Jousilahti, P<sup>1</sup><sup>1</sup>National Public Health Institute, Helsinki, Finland; <sup>2</sup>Finnish Heart Association, Helsinki, Finland

Obesity is an increasing public health problem globally. In more affluent countries, obesity is not only common in the middle-aged and elderly, but it is also becoming common among younger population.

We have investigated the long-term trends (1982-2007) and recent changes (2002-2007) in body mass index (BMI) in Finnish adults by age and education. The weight and height of Finns have been monitored regularly every five years in cross-sectional population surveys. The study population consists of over 30 000 men and women aged 25 to 64 years.

The mean BMI has increased from 26.2 to 27.2 kg/m<sup>2</sup> in men, and from 25.8 to 26.8 kg/m<sup>2</sup> in women between 1982 and 2007. Simultaneously, the proportion of subjects with BMI $\geq$ 30 has increased from 15% to 21% in men, and from 17% to 20% in women. It seems that the mean BMI for men has also increased during the last five year, but the increase may have leveled off among women. Young birth cohorts (under 45 years) were more obese than the same birth cohorts earlier, but the increase was leveled off among the older birth cohort. The differences in BMI between education groups have remained, especially in women. Well-educated subjects had the lowest BMI.

The results suggest that the long-term increasing trend of obesity may have leveled off in Finnish women. The differences in BMI between educational groups are still high, and the BMI has increased in younger adults. The results need to be confirmed in the next survey in 2012.

## T5:PS.132

**The role of child temperament in children's obesogenic eating behaviours: data from mothers and fathers**Haycraft, E.,<sup>1</sup> Blissett, J.,<sup>2</sup> Farrow, C.<sup>1</sup> & Meyer, C.<sup>1</sup><sup>1</sup>Loughborough University, Loughborough, UK; <sup>2</sup>University of Birmingham, Birmingham, UK

**Background:** Many parental factors, including their feeding practices and psychopathologies, have previously been related to children's eating behaviours, but the contribution of child temperament has received less research attention. The current study aimed to examine whether mothers' and fathers' reports of their child's temperament were associated with the obesogenic eating behaviours that they reported their child to engage in.

**Method:** Fifty-eight mother-father pairs of young children (mean age 39 months) completed self-report measures of their children's temperament and eating behaviours. The parents also provided data on their child's height and weight. Associations between children's temperament and eating behaviours were considered separately for mothers' and fathers' reports.

**Results:** Where fathers reported that their children were more emotional, they also reported that their children tended to eat more in response to emotions and were more responsive to satiety cues. Fathers also reported that active children were less responsive to food. Mothers who reported their child to be less shy and more sociable also reported that their child enjoyed food more. Greater responsiveness to internal satiety cues was evidenced in children whose mothers considered them to be more shy and emotional.

**Conclusions:** These data suggest a link between temperament and children's ability to regulate their food intake. That temperamentally less active children were perceived as more responsive to food may be an important step in our understanding of children's external eating.

## T5:PS.134

**Secular trends in height and weight among children and adolescents of the Seychelles, 1956-2006**Marques-Vidal, P.<sup>1,2</sup>; Madeleine, G.<sup>3</sup>; Romain, S.<sup>3</sup>; Bovet, P.<sup>2,3</sup><sup>1</sup>Centre for Cardiovascular and Metabolic Research (Cardiomet), Switzerland<sup>2</sup>Institute of Social and Preventive Medicine (IUMSP), University of Lausanne, Switzerland<sup>3</sup>Unit for Prevention and Control of Cardiovascular Disease (UPCCD), Ministry of Health and Social Services, Victoria, Seychelles

**Background:** Few data is available on long-term secular trends in height and weight in children in countries in transition. We assessed the secular trends in height and weight among representative samples of children and adolescents from the Seychelles (African region).

**Methods:** Weight and height data from all students of all schools in four selected school grades (kindergarten, 4<sup>th</sup>, 7<sup>th</sup> and 10<sup>th</sup> years) were collected by cross-sectional surveys for periods 1998-9 (3,676 boys, 3,715 girls) and 2005-6 (4,867 boys, 4,846 girls). Data from 1956-7 was extracted from a previously published report.

**Results:** Height increased, in boys, by 1.6 cm/decade for the period 1956-7 to 1998-9, and 1.1 cm/decade for the period 1998-8 to 2005-6; in girls, the corresponding figures were 0.9 cm/decade and 1.8 cm/decade. At age 15.5 years, boys/girls were taller by 10/13 cm in 2005-6 than in 1956-7. Weight increased, in boys, by 1.4 kg/decade for the period 1956-7 to 1998-9, and by 2.2 kg/decade for the subsequent period; the corresponding figures in girls were 1.1 kg/decade and 2.5 kg/decade.

**Conclusion:** Marked upward secular trends in body height and weight were documented in children and adolescents aged <16 years in the Seychelles, consistent with large changes in socio-economic and nutritional indicators in the considered 50-year interval. However, indirect evidence suggests that the secular height gain reflects accelerated growth during childhood over time with less than commensurate impact on adult height. Conversely, the largely steeper secular increase in weight than height is consistent with a pediatric obesity epidemic.

## T5:PS.135

**Adherence to the Mediterranean diet in relation to obesity status in children: The CYKIDS study**

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There is evidence regarding the association of adherence to Mediterranean diet (MD) to obesity, among adults; however there is no relevant data for any children's population. We aimed to investigate the association between adherence to MD and obesity status in children. A national cross-sectional study among 1140 children (mean age=10.7±0.98) using stratified multistage sampling design, in Cyprus was performed. Body Mass Index (BMI) was calculated according to IOTF criteria, from parental reference. Adherence to the MD was assessed by the KIDMED diet score. To test the research hypothesis logistic regression analysis was applied with dependent variable two categories of obesity status, normal weight (NW) vs. overweight/obese (OW/OB), and independent the three categories of the KIDMED score, after controlling for several potential confounders. Compared with low Mediterranean diet adherers, children with high KIDMED score were 80% less likely to be OW/OB [95%CI (0.041-0.976)], adjusted for age, gender, parental obesity status, parental educational level, as well as, dietary beliefs and behaviours. When physical activity was taken into account however, the aforementioned relationship was not significant [OR=0.20 95%CI (0.021-1.86)]. Furthermore, male gender, maternal obesity, and dietary beliefs and behaviours emerged as more significant in predicting obesity in children, compared to their KIDMED score. Adherence to the Mediterranean diet is inversely associated with obesity in children; however other behaviours, and in particular physical activity, seem to be more influential.

## T5:PS.138

**Dietary Behaviors and their relationship with overweight/obesity in adolescents of Ho Chi Minh City, Vietnam<sup>1</sup>**

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**Objective:** To examine the relationships between dietary behaviors and overweight/obesity among adolescents in urban areas of Ho Chi Minh City, Vietnam.

**Methods:** A prospective cohort study starting in 2004 with follow-up assessments at 12 and 24 months after baseline was conducted. Anthropometry, parental and child factors, child dietary behaviour information were collected from 378 boys and 407 girls from 18 junior high schools using questionnaires. Body mass index was assessed and overweight/obesity was defined using IOTF cut-offs. Dietary habits of consuming fruits/vegetables, soft-drinks, and snacks were classified as frequently; not frequently or rarely/don't consume. The frequency of having breakfast was divided into three levels: daily, most days, and seldom/some days. Generalized estimating equations using a hierarchical approach were employed to assess the longitudinal relationship between overweight/obesity and the predictors.

**Result:** After controlling for family factors, age, gender and pubertal status, frequently consuming snacks doubled the risk of being overweight/obesity (RR = 1.7, 95%CI = 1.3, 2.2) and consuming soft-drinks increased the risk three times (RR = 2.7, 95%CI = 2.2, 3.8). In contrast frequently consuming fruit/vegetables decreased the risk of overweight/obesity by 30% (RR = 0.7, 95%CI = 0.5, 0.8) and having breakfast daily decreased it by 20% (RR = 0.8, 95%CI = 0.7, 0.9).

**Conclusion:** The dietary habits of frequently consuming fruits/vegetables were protective against overweight/obesity. Messages to promote consumption of fruits/vegetables as well as having breakfast and too reduce the consumption of snacks and soft drinks appear to be promising themes in future obesity prevention programs in HCMC.

<sup>1</sup> Research relating to this abstract was funded by Health Department of Ho Chi Minh City and Nestle Foundation.

## T5:PS.137

**Protein intake and obesity in schoolchildren**

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**Background:** The influence of protein on the regulation of food intake and weight control remains incompletely understood. The objective of our study was to assess the association between protein intake and obesity risk in schoolchildren.

**Participants and methods:** The study was performed in a convenience sample of 1962 Portuguese school children (49.8% girls), 5-10-year-old (age was 7.5 ± 1.23 years). Height and weight were measured according to international standards, and body mass index (BMI) was calculated. The definition of obesity was based on average centiles according to the International Obesity Task Force cut-offs. Children's parents completed a self-administered questionnaire, which provided information on general family background characteristics, children's dietary intake (using a semi-quantitative food frequency questionnaire), and children's physical activity. Unconditional logistic regression models were fitted to estimate the magnitude of the association between protein consumption (adjusted for energy intake) and obesity in children, adjusting for confounders (age, breastfeeding, parental education, dietary fibre, total fat and energy intake).

**Results:** The prevalence of obesity was 14% in boys and 11% in girls. In boys, the probability of being obese increased significantly for those who were in the highest quartile of protein consumption adjusted for energy intake (OR = 1.70, 95% CI 1.01-2.85, p = 0.046), even after adjustment for confounders (OR = 1.99, 95% CI 1.13-3.50, p = 0.017); in girls, no association was found between protein intake and obesity.

**Conclusion:** High protein intake was positively associated with obesity in boys.

## T5:PS.139

**Sedentary behaviour as a determinant of coronary heart disease risk**

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**Purpose:** To establish, whether decreases in time spent sedentary could reduce CHD risk.

**Method:** Daily activities of 49 walking delivery and 49 office postal workers were measured using the activPAL™ activity monitor for seven continuous days. Time spent sedentary, upright, standing and walking, cadence, step count and energy expenditure (MET.h) were obtained. Anthropometric measurements and resting pulse and blood pressure (BP) were taken. Cardiorespiratory (CR) fitness was assessed using the 3-min Step Test. Socioeconomic strata (SES) were assessed on the Scottish Index of Multiple Deprivation (SIMD), scaled 1 to 5. Fasting blood samples were analysed for plasma glucose, total cholesterol, triglycerides, LDL, VLDL and HDL cholesterol, adhesion molecules, CRP, IL<sub>6</sub> and adiponectin. Framingham risk scores for CHD mortality were calculated. Multivariate analyses were done for differences and multiple correlations for any associations.

**Results:** There were significant differences in PA and fitness levels between delivery postmen and office staff. Fitness level was significantly associated with PA (p < 0.02) and CHD risk factors (p < 0.04). Time spent walking (p = 0.02) and daily step count (p = 0.03) were inversely associated with the number of metabolic syndrome components present in an individual. Time spent in sedentary posture was significantly associated with waist circumference (p = 0.01), plasma triglycerides (p = 0.01), VLDL cholesterol (p = 0.01), HDL cholesterol (p < 0.001) and adiponectin (p < 0.01) levels. SES was inversely related to PA and Framingham risk score (p = 0.04).

**Conclusion:** The associations between deprivation and CHD can be tackled through reductions in sedentary behaviour.

**Funding:** Research relating to this abstract was funded by Glasgow Caledonian University

## T5:PS.140

**Obesity in adolescents—results from a screening in a high school in Oradea, Romania**Vatca, L,<sup>1</sup> Demian, L<sup>1</sup>, Moldovan, C<sup>1</sup><sup>1</sup>University of Oradea, Oradea, Romania

Last decades are characterized by an epidemic increase of overweight and obesity among children and adolescents. In Romania, data about their prevalence are few. The aim of our screening was to evaluate overweight and obesity's prevalence among adolescents and to establish if there are particular aspects between these clinical conditions and other cardiovascular risk factors: hypertension, dyslipidemia, physical activity and nutrition

**Methods:** The study sample included 721 students 390(54,1%) girls and 331(49,5%) boys aged between 15-19 years from a high school in Oradea, Romania. For all adolescents we determined: weight, height, blood pressure and cholesterol's level. They were also invited to answer a questionnaire about lifestyle (physical activity, nutrition, smoking). In overweight and obese adolescents were determined blood level for: HDL-cholesterol, LDL-cholesterol, triglycerides, fasting glucose and insulin. Same blood parameters were determined for 80 normoponderals subjects.

**Results:** General prevalence for overweight was 8% without difference between boys and girls(9,5% versus 9%). Obesity's prevalence was 4,9% with a significant difference between boys-7,4% and girls-4,1%(p<0,001). Hypertension's prevalence is double in those who are overweight or obese comparing to normoponderals.(19,4% versus 8,8%). Comparing with normoponderals in overweight and obese teenagers are significant differences in blood level for: triglycerides(88,0±9,4 mg/dl versus 122,2±13,7 mg/dl p<0,01), LDL-cholesterol(76,8±8,7 versus 118,2±13,3 mg/dl p<0,01) and HDL-cholesterol(33,3±6,2 mg/dl p<0,05). There were no differences in blood level for insulin, fasting glucose and total cholesterol. Overweight and obese adolescents were physically inactive and had a bad nutrition with a low intake of fruits and vegetables and a great intake of snacks, cookies, beverages and saturated lipids.

**Conclusions:** 1. Among Romanian adolescents overweight and obesity are highly prevalent. 2. From adolescence, in an important number of cases overweight and obesity are clinical condition strongly associated with cardiovascular risk factors. 3. Our results are an alarm signal for the health status in this age. So, it is mandatory to start obesity's prevention as early as we can.

## T5:PS.142

**The national prevalence of overweight in school-age children in Switzerland has decreased between 2002 and 2007**Aeberli I<sup>1</sup>, Amman R.S.<sup>1</sup>, Knabenhans M.<sup>1</sup>, Zimmermann M.B.<sup>1</sup><sup>1</sup>ETH Zürich, Institute of Food Science and Nutrition, Human Nutrition Laboratory, Zürich, Switzerland

**Background:** In a national study in 2002, the prevalence of childhood overweight in Switzerland was estimated to be nearly 20%. Since then, a number of school- and community-based public health programs have been put in place in an effort to reduce this high prevalence.

**Objective:** The aim of this study was to determine the national prevalence of childhood overweight in Switzerland in 2007, and make comparisons to the 2002 data, to determine if these public health programs have had an impact.

**Study design:** A 3-stage, probability-proportionate-to-size cluster sampling of primary schools (n= 56) was used to obtain a representative sample of 6 to 13 year old children, as in 2002. Weight, height, four skinfold thicknesses and waist circumference were recorded. Body mass index and body fat percentage were then calculated and compared to data in 2002.

**Results:** The response rate in both the 2002 (n= 2431) and 2007 studies (n=2169) was ca.73%. In 2007, the prevalences of overweight (> 85<sup>th</sup> percentile of the U.S. CDC reference population) and obesity (> 95<sup>th</sup> percentile) were 16.1% and 5.6% in boys and 12.8% and 3.3% in girls, respectively. Compared to the data from 2002, the prevalence of overweight has decreased 3.8% in boys and 6.1% in girls. Mean body fat percentage of boys (18.6%) and girls (20.9%) in 2007 was similar to that in 2002.

**Conclusion:** The national prevalence of childhood overweight appears to have decreased in Switzerland over the past 5 years. This is likely due to public health campaigns to increase awareness of the problem and a positive impact of the intervention programs set-up across the country.

**Sponsorship:** The study was financed by the the Swiss Ministry of Health.

## T5:PS.141

**Long-term results of facts-diet compared to a weight reduction achieved with other diets (low fat or low carb diet)**Adam O<sup>1</sup>, Lorenz Y<sup>1</sup>, Schnurr C<sup>1</sup>

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**Introduction:** We aimed to improve nutritional adequacy, health effects, long-term weight reduction, and patient's adherence of commonly used diets by the periodically separated given combination of a very low-carb and very low-fat diet.

**Material and Methods:** 517 obese patients (BMI 35 ± 5 kg/m<sup>2</sup>) took part in weekly patient classes for 10 weeks. Information was provided on how to separate as far as possible fat and carbohydrates in the diet, nutritional behaviour, physical activity and psychological background of obesity. Participants were asked to follow a very low-fat diet for breakfast and lunch, and after an interval of 4 hours switch to a very low-carb diet for dinner, and take two snacks per day (FaCts=Fat, Carbohydrate, timed snacks). Thereafter participants were offered monthly visits for 6 months; follow-up examinations were done for 7 years.

**Results:** Out of 517 participants 74 did not complete patient classes. According to intention-to-treat-analyses the BMI changed to 32 ± 5 kg within 10 weeks. Weight reduction after 1 and 7 years ranged from 6.5 ± 6.1 kg to 5.5 ± 5.1 kg (mean ± SD). Dietary protocols attested the participants a balanced diet and laboratory findings revealed an improvement of metabolic parameters. The participants of the FaCts-diet lost more weight compared to participants of a low-fat diet and the same amount of weight compared to a low-carb diet.

**Summary:** FaCts-diet is an easy to learn and more balanced nutrition, as compared to low-fat or low-carb diets, and improves long-term weight reduction and obesity associated risks.

## T5:PS.143

**Blends of arabic gums provide satiety and decrease energy intake upon consumption.**Calame, W<sup>1</sup>, Thomassen, F<sup>2</sup>, Flynn, C<sup>1</sup>, Siemensma, AD<sup>1</sup>.<sup>1</sup>Kerry Ingredients, Tralee, Ireland<sup>2</sup>Clinical Trial Management, Maastricht, The Netherlands.

**Aim:** to investigate whether EmulGold and Previtae, two blends of Arabic gums, yield a significant satiety perception level during and a subsequently low energetic intake after 3 hrs of consumption in healthy volunteers.

**Material and methods:** in a double-blinded placebo-controlled cross-over human trial 12 healthy volunteers (using power analysis at the 40 g dosis) consumed various doses (0, 10, 20 or 40 grams) of EmulGold or PreVitae dissolved in water after a standardized breakfast. During three hours they were asked about various aspects of satiety (VAS: visual analogue scale) and after 3 hrs they were allowed to consume an *ad libitum* lunch, at which the caloric intake was measured.

**Results:** within the three hours all doses of Arabic gum yielded significantly higher satiety perception than water. Interestingly, at 40 grams doses EmulGold obtained significantly (p< 0.01) higher levels than PreVitae. However, the slope of the curve of the latter revealed a longer lasting effect than obtained for the former. With respect to the energy intake a lower intake (110 to 220 kcal) was noted for all doses tested, being significant (p < 0.03) for both blends at the 40 g level, with PreVitae significantly (p < 0.03) lower than EmulGold.

**Conclusions:** EmulGold and PreVitae establish a significant satiety perception for at least 3 hrs after consumption. This is accompanied by a lower energy intake, being significant at the 40 grams level. Therefore, both gums can be used in concepts to support body weight management.

## T5:PS.144

**Prevalence and predictors of overweight in Florianópolis, Southern Brazil: Behavioural Risk Factor Surveillance System.**

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Universidade Federal De Santa Catarina

**Purpose:** To investigate the prevalence and the predictors of overweight and obesity in adults from Florianópolis city, interviewed by telephone.**Methods:** Cross sectional study with 2013 adults (40.8% men) aged 18 years and older, participating in the 2005 Behavioural Risk Factor Surveillance System. Height and weight were reported by the participants. Overweight was defined as BMI  $\geq 25\text{kg/m}^2$ . Sex-specific relationships of being overweight with sociodemographic factors and lifestyle behaviours were analyzed using Poisson regression.**Results:** The prevalence of overweight was 39.4% (men=45.2%, women=33.7%,  $p<0.01$ ). Overweight men and women were more likely to be older, married, and employed. For women, to be non-white colour and being studied less than 9 years were also associated with the risk of overweight. Controlling for sociodemographic factors, overweight men were more likely to report that they were smokers (prevalence ratio (PR) = 1.16, 95% confidence interval (CI) 1.05-1.30). A protective effect against overweight were observed for men reporting consumption of fruits and vegetables five or more times a day (PR=0.76, 95%CI 0.60-0.96), and reporting not eating beef, as compared to those reporting consumption of meat with visible fat (PR=0.57, 95%CI 0.38-0.87). Compared with women who reported consumption of alcoholic drinks more than seven doses per week, those who reported consumption rarely or never, were less likely to be overweight (PR=0.67, 95%CI 0.49-0.92).**Conclusions:** A high rate of overweight was observed in adults from Florianópolis city. The findings indicate the importance of identifying sociodemographic characteristics and life style behaviours associated with the risk of overweight.

## T5:PS.146

**Change in nutritional status of adult women in Tunisia from 1996 to 2005: effect of living environment and socio-economic factors**El Atti, J<sup>1</sup>, Traissac, P<sup>2</sup>, Béji, C<sup>1</sup>, Aounallah-Skhiri, H<sup>4</sup>, Gaigi, S<sup>1</sup>, Kolsteren, P<sup>3</sup>, Ben Romdhane, H<sup>4</sup>, Delpeuch, F<sup>2</sup>, Maire, B<sup>2</sup><sup>1</sup>National Nutrition Institute, Tunis, Tunisia; <sup>2</sup>Research Unit 106, Nutrition, Food, Societies, IRD Montpellier, France; <sup>3</sup>Institute of Tropical Medicine, Antwerp, Belgium; <sup>4</sup>National Institute of Public Health, Tunisia**Background and objective:** Tunisia is currently undergoing a nutritional transition contributing to high prevalences of non communicable diseases. In a context of nationally rising prevalences of obesity this study aimed at assessing differential effect of Urban (U) vs Rural (R), geographical and socio-economic factors.**Methods:** Data on women 35-70 y were from two nationally representative stratified clustered samples in 1996/97 (n=1506) and 2005 (n=3045). Body mass index (BMI)=weight/height<sup>2</sup> $\geq 30\text{kg/m}^2$  defined obesity and waist circumference in cm (WC) abdominal fat accumulation.**Results:** Nationally, from 1996 to 2005, mean(s.e.) BMI (prevalence of obesity) rose from 27.5(0.2) (31.0%) to 28.4(0.2) (36.9%) and mean(s.e.) WC from 85.3(0.5) to 91.2(0.4). Sharp U vs R contrasts in 1996 decreased somewhat in 2005 for BMI (+3.4,  $p<0.0001$  to +2.8,  $p<0.0001$ ), WC (+7.3,  $p<0.0001$  to +5.8,  $p<0.0001$ ) and obesity (OR=3.1,  $p<0.0001$  to OR=2.5,  $p<0.0001$ ). Apart from expected reduction in U vs R contrasts, adjustment for socio-economic factors somewhat reduced their 1996 to 2005 differential evolution: for BMI (+1.4,  $p<0.0001$  to +1.3,  $p<0.0001$ ), WC (+2.7,  $p=0.027$  to +2.9,  $p=0.0015$ ) as well as obesity (OR=1.6,  $p=0.001$  to OR=1.5,  $p=0.0028$ ). Analogous results were observed for evolution of contrasts between more and less developed administrative/geographical regions.**Conclusion:** In a global context of rising BMI, WC and obesity among Tunisian women, though still significant, geographical and environmental contrasts somewhat reduced between 1996 to 2005 attesting a sharper increase in less developed or rural environments, partly due to diminishing socio-economic contrasts between environments. Differential changes in socio-cultural factors may also be involved.**Funding:** Research relating to this abstract was funded by the European Union (INCO: Med Projects (1998-2002) Epidemiological Transition And Health Impact in North Africa (TAHINA) Contract Number: ICA3-CT-2002-10011), the Tunisian National Institute of Nutrition and IRD.

## T5:PS.145

**Nutrition report of patients with metabolic syndrome – comparison of patients with and without manifest type 2 diabetes**Dzien A<sup>1</sup>, Winner H<sup>2</sup>, Lechleitner M<sup>3</sup>, Dzien-Bischinger C<sup>1</sup>, Theurl E<sup>4</sup><sup>1</sup>Medical Center, Innsbruck, Austria; <sup>2</sup>Department of Economics and Statistics, University of Innsbruck; <sup>3</sup>Krankenhaus Hochzirl, Austria; <sup>4</sup>Institut Für Finanzwissenschaft, UNI Innsbruck**Background and Aims:** Landmark studies could demonstrate that dietary intervention and physical exercise are highly effective in preventing the manifestation of type 2 diabetes in patients with impaired glucose metabolism. Less data are available about possible differences in nutrition in daily life between patients with manifest type 2 diabetes mellitus and those at an increased risk for type 2 diabetes.**Patients and Methods:** In a medical outdoor center a questionnaire about nutrition in daily life was part of the routinely performed clinical and laboratory measurements at the initial visit. The questionnaire comprised 50 typical middle-European food items and was evaluated by 2 dietitians. 148 patients revealed a metabolic syndrome without manifest diabetes, 43 with manifest type 2 diabetes. During the further treatment procedures all patients obtained dietary instructions according to the recommendations of the Austrian Diabetes Association.Data are characterized by mean and standard deviation. Group comparisons were conducted by Student's *t* test or nonparametric Mann Whitney *U* test. Frequency distributions were compared using the chi-squared test. A *p* value  $< 0.05$  was considered statistically significant.**Results:** Patients with manifest type 2 diabetes (HbA1c value  $7.3\pm 1.2\%$ ) were older ( $63.9\pm 12.9$  years) and revealed a higher BMI ( $28.1\pm 4.5\text{ kg/m}^2$ ) compared to patients without manifest diabetes (age:  $58.0\pm 9.8$  years,  $p<0.001$ ; BMI:  $26.2\pm 3.9\text{ kg/m}^2$ ,  $p<0.020$ ). Type 2 diabetics reported a significantly lower intake of fibre (brown bread, salad, vegetables and fruits) than patients without manifest diabetes ( $1.7\pm 1.4$  times per day compared to  $4.4\pm 1.4$  times), and a higher intake of meat products ( $2.1\pm 1.1$  times per day compared to  $1.8\pm 0.9$  times). Reported intake of soft drink was lower in diabetics ( $0.8\pm 0.8$  times per day) compared to non-diabetics ( $1.3\pm 1.0$  times per day), no differences could be found with respect to the reported alcohol intake.**Conclusion:** The results of our evaluation seem to support the importance of an increase in fibre intake and reduction of meat consumption in daily life in the prevention of manifest type 2 diabetes.

## T5:PS.147

**Lazytown kids health initiative – motivating children to eat healthier food**Gunnarsdottir, I<sup>1</sup>, Eysteinsdottir T<sup>1</sup>, Thorsdottir I<sup>1</sup><sup>1</sup>Unit for Nutrition Research, Landspítali-University Hospital & Department of Food Science and Human Nutrition, University of Iceland, Reykjavik, Iceland.LazyTown is an Icelandic children's television program that has been highly successful, airing in over 100 countries. LazyTown's vision is to become a leading brand for healthy choices. LazyTown food and beverages will soon be introduced in Iceland, a product development brought forth by collaboration between the food industry, Unit for Nutrition Research, trailers and LazyTown. The goal is to market a wide variety of healthy food for children, in appropriate portion sizes. The first products will be launched in January 2008 and will be available in trailers in Iceland. The project "LazyTown Kids Health Initiative – Motivating children to eat healthier food" is a novel approach in the public health sector using a popular brand to increase availability of healthy food and promote healthy eating habits among children. A baseline study on dietary habits of 3- and 5-year-old children (n=460) was conducted in the Reykjavik area from January 2007-July 2007. Consumption of vegetables was on average  $32\pm 32\text{ g/day}$  and  $44\pm 40\text{ g/day}$ , and intake of fresh fruit  $107\pm 69\text{ g/day}$  and  $109\pm 75\text{ g/day}$  among 3- and 5-year olds, respectively. Average consumption of soft drinks and other sweetened drinks was  $61\pm 93\text{ g/day}$  and  $87\pm 103\text{ g/day}$ . An endpoint study where any possible effects of the LazyTown introduction will be evaluated is planned in year 2009. Several smaller studies are planned in relation to the project, including taste preference tests, attitude surveys among parents, market research and cost effectiveness analyses. Other health related initiatives in Iceland during the study period will be recorded.**Conflict of interest:** None disclosed. Unit for Nutrition Research, or individual researchers at the institute, will not receive any funding or salary from LazyTown, the food industry or trailers.**Funding:** The Public Health Institute of Iceland, The Icelandic Centre for Research, The Landspítali-University Hospital Science Fund, University of Iceland Research Fund.

## T5:PS.149

**FTO gene associated fatness in relation to body fat distribution and metabolic traits throughout the range of fatness in white men**

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**Background:** We investigated how the common FTO rs9939609 (T/A) and its associated total body fatness are related to abdominal and peripheral fatness and metabolic traits in white men.

**Methods:** Obese young white men (n=753, BMI $\geq$ 31.0 kg/m<sup>2</sup>) at the draft board examinations and a randomly selected group (n=879) were examined in two surveys (mean age 35 and 45, respectively) using logistic regression to assess age-adjusted z-score odds ratios.

**Results:** Fat body mass index was associated with the rare AA genotype (OR=1.21, p=4.6\*10<sup>-7</sup> and OR=1.21, p=1.0\*10<sup>-3</sup>, survey 1 and 2, respectively). Increased abdominal fatness was seen for the AA genotype measured as waist circumference (OR=1.21, p=2.2\*10<sup>-4</sup> and OR=1.19, p=5.9\*10<sup>-3</sup>), sagittal abdominal diameter (OR=1.17, p=1.3\*10<sup>-4</sup> and OR=1.18, p=0.011) and intra-abdominal adipose tissue (OR=1.21, p=0.005). Increased peripheral fatness measured as hip circumference (OR=1.19, p=1.3\*10<sup>-3</sup> and OR=1.18, p=0.004) and lower body fat mass% (OR=1.26, p=0.002) was also associated with the AA genotype. The AA genotype also associated with decreased Stumvoll insulin sensitivity index (OR=0.93, p=0.02) and with decreased non-fasting plasma HDL-cholesterol (OR=0.57, p=0.037). All significant results for body fat distribution and metabolic traits were explained by a mediating effect of fat mass.

**Conclusions:** The association of the A-allele of FTO rs9939609 to global body fatness throughout the range of fatness is confirmed, and this association explains the relation between the gene variant and body fat distribution, decreased insulin sensitivity and decreased HDL-cholesterol. The SNP was not significantly associated with other metabolic traits suggesting that they are not derived from the general accumulation of body fat.

**Funding:** Research related to this abstract was funded by Center for Pharmacogenomics, University of Copenhagen, Denmark

## T5:PS.151

**Maternal Overweight and Obesity versus Breastfeeding Success**

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**Introduction and Aims:** Maternal Obesity has been associated with a poor lactation in animal models but these results are inconclusive on investigations made with Human. Because the prevalence of overweight and obesity is increasing dramatically among women in reproductive age mainly, in Portugal investigations that relate to the maternal obesity breastfeeding are necessary, which is the main purpose of this study warning of the importance of a pregnancy planned and this point to the importance of controlling weight.

**Methods:** In the sample were included all primiparous mothers of singletons (n = 680) aged between 19 and 40 years, whose son was born between 24 May and 31 October 2007 in the Hospital de São João, Centro Hospital of Vila Nova de Gaia and Unidade Local de Saúde de Matosinhos, SA, which tried to breastfeed after birth. Body mass index (BMI) before pregnancy and gestational weight gain were categorized according to guideline from the Institute of Medicine.

**Results:** Regardless of gestational weight gain, overweight/obese women ( $\alpha=0,029$ ) were less likely to initiate breastfeeding (defined as the child to be breastfed exclusively with breast milk until at least the first two weeks post-partum) than women with a normal BMI before pregnancy. Because the follow-up (telephone interviews will be made after two weeks, two months and six months post-partum) isn't over yet, results can not be accurate described about the duration of breastfeeding, however it is expected that both obesity before pregnancy and inadequate gestational weight gain have a negative effect on breastfeeding practice.

## T5:PS.150

**E-KINDEX, a novel dietary index that is associated with obesity status in children**

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**Background:** There are not any published dietary indices that evaluate the synergistic effect of various dietary components, beliefs and practices on obesity development, among children.

**Objective:** We sought to develop a dietary index, which a-priori incorporates several dietary characteristics and practices that have been implicated in the development of obesity.

**Methods:** Data from a nationwide cross sectional data, among 1140 children (10.7 $\pm$ 0.98 years). The proposed E-KINDEX integrates into a single score three other indexes: a food groups intake index, an index related to eating beliefs and behaviours and an index that evaluate dietary practices (including meal patterns). The aforementioned indices are composed of 13, 8, 9 components, respectively. The total E-KINDEX score ranges from 1 (worst) to 87 (best).

We applied the E-KINDEX score in a sub-sample of 634 children of our study (11.7 $\pm$ 0.83 years), for whom height, weight and waist circumference (WC) were measured. Obesity status was defined according to age-sex specific criteria by IOTF.

**Results:** The mean E-KINDEX score was 58.2 $\pm$ 7.8. The E-KINDEX score was associated with 83% less likelihood of being obese or overweight (OR=0.17, 95%CI 0.08-0.37), and 81% less likelihood of having WC $\geq$ 77cm (OR=0.19, 95%CI 0.08-0.44), after adjusting for age, sex and physical activity. Cut-off point analysis revealed that the optimal value of the score, which discriminates children with normal weight from overweight/obese, is 60.5/87. The sensitivity of this threshold was 74%, while the specificity was found to be 54%.

**Conclusion:** The proposed E-KINDEX score is associated with obesity status in children and may be a useful tool for public health for the prevention and management of childhood obesity.

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## T5:PS.152

**Obesity treatment for children and youth in Germany – report of an observational study**

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**Background:** The prevalence of childhood obesity in Germany is high (and still increasing). Therefore a great number of different treatment programmes have been developed in recent years, focusing on different aspects of therapy as nutrition, activity or psychosocial issues. But only few interventions have been evaluated regarding effectiveness and long-term results.

**Objective:** Based on this starting point the Federal Centre for Health Education (FCHE) decided to initiate an observational study to give an overview of the effectiveness of obesity treatment in Germany. Two main issues were:

What effects did the interventions have on the physical and mental conditions of the patients?

What key factors (e. g. therapy concept and intensity) influenced the therapy results?

**Method:** The nationwide observational study started in 2006 as a longitudinal trial. The interventions were grouped in six clusters (1. inpatient treatment 2. day-cases treatment 3. outpatient treatment with focus on a) nutrition b) activity c) psychosocial issues or d) multi disciplinary approach) Main outcome measures were BMI-SDS, comorbidity (blood pressure, lipid profile), quality of life and behaviour modification. Medical and psychological data were collected before and after the intervention, interval depending on the length of treatment. Follow-up data is collected one year after the end of intervention.

**Participants:** 1976 children and youth aged from 8-16 years (mean 12.4 years) with a BMI above the 90<sup>th</sup> percentile.

**Results:** First results show a significant reduction of the degree of obesity in all intervention clusters.

The mental condition showed a significant improvement after intervention, especially with inpatient-programmes.

## T5:PS.153

**Limited agreement between body mass index, waist and body fat in diagnosing obesity in the Swiss population**

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**Objective:** to assess the agreement between different anthropometric markers in defining obesity and the effect on the prevalence of obese subjects.

**Methods:** population-based cross-sectional study including 3213 women and 2912 men aged 35–75 years. Body fat percentage (%BF) was assessed using electric bioimpedance. Obesity was defined using established cut-points for body mass index (BMI) and waist, and three population-defined cut-points for %BF. Between-criteria agreement was assessed by the kappa statistic.

**Results:** in men, agreement between the %BF cut-points was significantly higher (kappa values in the range 0.78 – 0.86) than with BMI or waist (0.47 – 0.62), whereas no such differences were found in women (0.41 – 0.69). In both genders, prevalence of obesity varied considerably according to the criteria used: 17% and 24% according to BMI and waist in men, and 14% and 31%, respectively, in women. For %BF, the prevalence varied between 14% and 17% in men and between 19% and 36% in women according to the cut-point used. In the older age groups, a four-fold difference in the prevalence of obesity was found when different criteria were used. Among subjects with at least one criteria for obesity (increased BMI, waist or %BF), only one third fulfilled all three criteria and one quarter two criteria. Less than half of women and 64% of men were jointly classified as obese by the three population-defined cut-points for %BF.

**Conclusions:** the different anthropometric criteria to define obesity show a relatively poor agreement between them, leading to considerable differences in the prevalence of obesity in the general population.

## T5:PS.155

**Food security is associated with weight status of women but not men in Iranian households**

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**Background & Aims:** Several studies in developed countries have shown more overweight/obesity among food insecure household members especially women. This study aimed to assess the association between food security and weight status with controlling the effect of other related factors in adult members of Iranian households.

**Materials & Methods:** This cross-sectional study was conducted in the framework of the Comprehensive Study on Household Food Consumption Patterns and Nutritional Status of I.R. Iran during 2001-2003. Households were selected through systematic cluster sampling method in urban and rural areas. Height and weight of all household members were measured based on standard protocols and body mass index (BMI) was calculated. Weight status, including underweight, normal weight, overweight, and obesity was defined based on cut off values recommended by NIH. Socio-economic status (SES) of household was assessed by a questionnaire through structured interviews. Assessment of food consumption patterns was done using three consecutive 24hour diet recalls completed by trained nutritionists. Food insecurity was defined in three levels of daily energy requirements as follow: meeting 80-90, 70-79 and lower than 70% were considered as mild, moderate and severe food insecurity, respectively. Logistic regression was used to test the effects of SES and food security variables on weight status, simultaneously.

**Findings:** Total of 7158 studied households, including 2496(34.9%) rural and 4662(65.1%) urban of whom 5.2, 7.6 and 9.9 percent were categorized as severe, moderate, and mild food insecure, respectively. In men and women 30 and 34.3% were overweight and 9.9 and 26.7% were obese, respectively (P<0.001). Logistic regression in 6083 men did not show any significant association between weight status and food insecurity after controlling SES variables. However, overweight increased with higher educational levels, housing condition (P<0.01), and score of facilities in house (P<0.001) in men. In severe and moderate food insecure women (n=7960) overweight was 1.5 times (CI: 1.22-1.94 & CI: 1.27-1.88, P<0.001) and in mild food insecure women was 1.2 times (CI: 1.04-1.43, P<0.001) more than their food secure counterparts. Overweight decreased with higher educational levels and increased with being married, urbanization, score of facilities in house (P<0.001) and higher housing condition (P<0.05) in women.

**Conclusion:** Food insecurity is correlated with overweight in Iranian women and food insecure households women are more likely to be overweight than food secure ones. This association is not clear in men.

**Key words:** Household food security (HFS), Socio-economic status, Overweight, Obesity, Gender

## T5:PS.154

**Accidental detecting of diabetes mellitus t. 2 in patients with obesity**

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**Summary**

**Background and Aims:** Several clinical observations show a more frequent prevalence of metabolic disorders in obese persons. Those disorders are discovered very often accidentally. There is a progressive increase in the prevalence of type 2 diabetes worldwide, due to the dramatic augmentation of obesity.

**Methods:** We analysed 149 patients of our Department to determine the existing disorders in carbohydrate metabolism. The inclusion criterion was the BMI > 30 kg/m<sup>2</sup>. We exclude the patients with secondary obesity, previously diagnosed diabetes mellitus t. 2. In every patient we made the anthropometric measurement (weight, height, BMI, waist, hip, % body fat). We analysed also blood lipids, systolic (SBP) and diastolic (DBP) blood pressure. To examine carbohydrate metabolism we done the oral glucose tolerance test (OGTT) in every patient.

**Results:** The average age of analysed population was 48,8 +/- 13,0 years, BMI 38,1 +/- 7,7 kg/m<sup>2</sup>, % fat 43,4 +/- 10,0. The average SBP was 140,0 +/- 21,5 mmHg, DBP 87,9 +/- 12,8 mmHg, total cholesterol 5,3 +/- 1,2 mmol/l, HDL 1,1 +/- 0,3 mmol/l, LDL 3,2 +/- 1,0 mmol/l, TAG 2,1 +/- 1,8 mmol/l. In analysed group of 149 obese patients according to OGTT we found 21 patients with new diabetes mellitus (14 % of population) and 53 patients with impaired glucose tolerance (36%).

**Conclusion:** 1. In about 50% of obese patients we found disorders in carbohydrate metabolism.

2. OGTT is a valuable and simple test in searching for diabetes mellitus. In every patients with obesity we should consider the OGTT.

## T5:PS.156

**Dietary antioxidant capacity is inversely related to BMI Z-score and fat mass among obese children and adolescents**

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**Background:** When energy intake exceeds energy expenditure, some cells may stimulate reactive oxygen species generation. Excessive production of these molecules induces "oxidative stress" that has been related with obesity. However, some dietary micronutrients have antioxidant capacity and may have a protector effect against obesity. We have analysed the relationship between obesity degree in children and adolescents and total dietary antioxidant capacity.

**Methods:** A group of 184 obese children and adolescents (6-18 years old) was recruited through Paediatric Departments of hospitals and Primary Care Centres in Navarra (North of Spain). Anthropometric measurements were obtained according to standard protocols and dietary intake was assessed by a validated food-frequency questionnaire (FFQ). The FFQ was used to calculate vitamin C intake, total energy intake and total dietary antioxidant capacity.

**Results:** BMI z-score data resulted to be negatively correlated with the total antioxidant capacity of diet ( $r = -0.163$ ;  $p = 0.028$ ), when we estimated a partial correlation coefficient adjusted for total energy intake. The percentage of fat mass was also inversely correlated with total antioxidant capacity of the diet ( $r = -0.177$ ;  $p = 0.020$ ) in a fully adjusted model (taking into account total energy intake, sex, age).

**Conclusion:** Severe obese children and adolescents show a lower dietary antioxidant capacity than children and adolescents with a lower obesity degree.

## T5:PS.157

## Obesity and asthma in schoolchildren

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**Background:** Asthma and obesity are major public health problems in childhood, but controversy remains regarding the mechanisms underlying this relationship. The aim of this study was to evaluate the association between asthma and obesity risk in schoolchildren.

**Participants and methods:** The study was performed using a convenience sample of 1962 Portuguese school children (49.8% girls), 5-10-year-old. Height and weight were measured according to international standards, and body mass index (BMI) was calculated. The definition of obesity was based on average centiles according to the International Obesity Task Force cut-offs. Children's parents completed a self-administered questionnaire, which provided information on general family background characteristics, children's dietary intake (using a semi-quantitative food frequency questionnaire) and asthma (based on the following question: "Have you ever been told by any doctor that your son had asthma?"). Unconditional logistic regression models were fitted to estimate the magnitude of the association between asthma and obesity in children, adjusting for confounders (age and energy intake).

**Results:** The prevalence of obesity was 11.0% in girls and 14.0% in boys and the prevalence of asthma was 7.3% in girls and 11.0% in boys. Girls reporting asthma presented a two-fold risk for being obese (OR = 2.07, 95% CI 1.06-4.05, p trend = 0.05), even after further adjustment for confounders (OR = 2.16, 95% CI 1.10-4.24, p trend = 0.05). In boys, no association was found between asthma and obesity.

**Conclusion:** Asthma was positively associated with obesity in girls.

## T5:PS.159

## Effects of exercise on risk factors, exercise capacity and body composition in obese individuals, class I-III.

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The effects of different exercise intensities in severely obese individuals (mean BMI = 42.1; range 33.3-64.8) were explored. Subjects were randomised into two groups and exercise performed for 16 weeks. Tests were performed prior and after the exercise period. Both groups performed supervised exercise 3 times a week. A high intensity group (HI, n=51) exercised for 1 hour, and a low intensity group (LO, n=43) for ½ hour, on each occasion. The LO group also performed non-supervised exercise at least 3 times a week.

	High intensity			Low intensity		
	Test 1	Test 2	(n)	Test 1	Test 2	(n)
Weight (kg)	123	120 ***	51	122	120 *	43
BMI (kg · m <sup>-2</sup> )	42	40 ***	51	43	42 **	43
Fat (% of body weight)	46.3	45.0 ***	51	46.5	46.0 <sup>ns</sup>	43
Fat (kg)	54.5	51.6 ***	51	55.0	53.5 <sup>ns</sup>	43
VO <sub>2</sub> max (L · min <sup>-1</sup> )	2.7	2.9 ***	51	2.2	2.3 *	43
VO <sub>2</sub> max (ml · min <sup>-1</sup> · kg <sup>-1</sup> )	22.3	24.8 **	51	18.8	20.1 *	43
BPsyst (mmHg)	153	144 ***	28 <sup>†</sup>	160	144 **	24 <sup>†</sup>
BPdiast (mmHg)	99	90.8 **	21 <sup>†</sup>	99	90 ***	20 <sup>†</sup>
TG (microMol/L)	2104	1656*	26 <sup>†</sup>	1955	1830 <sup>ns</sup>	26 <sup>†</sup>
LDL (mMol/L)	4.8	4.3*	20 <sup>†</sup>	4.8	4.4 <sup>ns</sup>	20 <sup>†</sup>
Glucose (mMol/L)	8.2	7.2 <sup>ns</sup>	13 <sup>†</sup>	9.0	7.0 **	9 <sup>†</sup>

Table: Mean values and statistical significance.

<sup>†</sup> Risk factors were evaluated, only for subjects with initially increased levels.

In conclusion, all evaluated parameters were numerically improved in both groups (Table). In the HI group, several parameters improved with greater significance than in the LO group.

## T5:PS.158

## Obesity remains underdiagnosed in english hospital in-patients

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Organised medical management of obesity in England remains poorly developed; hospitals are required as a performance standard to have reporting systems in place to identify in-patients with a BMI ≥ 27 with a co-morbidity or BMI ≥ 30. We have audited compliance with this performance standard in two hospitals. Notes and clinical records of all patients were inspected on sample medical, surgical and acute admission wards. Data on height, weight, BMI, waist circumference, clinical statement about body habitus, and current prescription of drugs for cardiovascular or metabolic disease were recorded. Where height was not recorded, an estimated BMI was calculated using 'average' height for men (1.75m) and women (1.61m).

**Table: Weight, BMI and waist circumference recorded on inpatients**

Anthropometry	Hospital A n=156			Hospital B n=147		
Weight	110 (70.5%)			85 (57.82%)		
Waist circum.	none			none		
BMI's recorded	78 (50%)			14 (9.5%)		
<b>BMI category</b>	<b>BMI≥30</b>	<b>BMI≥27</b>	<b>BMI&lt;20</b>	<b>BMI≥30</b>	<b>BMI≥27</b>	<b>BMI&lt;20</b>
Recorded	2415.3%	4126.2%	117.0%	96.1%	10(6.8%)	-
Estimated	95.7%		-	1610.9%	4127.9%	1510.2%

Under-reporting of BMI is common. Length of stay impacted upon weight records: weight was recorded in no patients with <2 days and only 80% with ≥8 days admission. Paradoxically, those with CV or diabetes-related conditions were less likely to have a weight recorded. Waist circumference was not recorded on any patient.

Recognition of overweight and obesity (and also presumably underweight) remains poor in English hospitals.

## T5:PS.160

## Changes of body weight in outdoor patients - relationship with morbidity and medication during an observation period of 11 years

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**Objective:** In many overweight and obese patients weight reduction and weight maintenance are difficult to obtain, especially under clinical routine procedures. In addition to counseling programs the diagnosis of metabolic disease or cardiovascular disorders could be of influence on the patient's motivation to lose body weight.

**Methods:** Clinical and laboratory results of 3193 patients attending a medical outdoor center were evaluated. Diagnosis and the need for medication were compared between patients with a successful weight loss and those with a continuous weight gain during an observation period of 11 years.

**Results:** In the female study population (n=1844) the percentage of patients with normal BMI was 46%, with overweight 19%, with obesity 22% and with morbid obesity 2%. In the male study population (n=1349) 44% of the patients revealed a normal BMI, 40% were overweight, 10% obese and 1% morbidly obese. A counseling program comprising dietary instructions and recommendations for physical activity was offered to all overweight and obese patients.

During the following observation period of 11 years, successful and maintained weight loss could be observed in 313 patients with a mean BMI of 26.8±2.6 kg/m<sup>2</sup> at the first visit and 25.2±3.3 kg/m<sup>2</sup> (p<0.001) at the latest control. At the initial visit this group of patients with a successful weight loss revealed more unfavourable metabolic results and a higher prevalence of type 2 diabetes (12.5%), hypertension (38%) and coronary heart disease (19%), than the group of 330 patients with a continuous increase in BMI (type 2 diabetes 7.2%, hypertension 25%, coronary heart disease 12%). During the observation period of 11 years the prevalence of diabetes increased for 1.2% in patients with weight loss and for 1.8% in those with weight gain. The increase in cardiovascular medication was 24% in patients with weight loss and 48% in the group with weight gain.

**Conclusion:** The results of our evaluation indicate that in addition to counseling programs the diagnosis of metabolic or cardiovascular disease might be a strong motivator for patients to lose body weight successfully and to maintain this effect for years.

## T5:PS.161

**'Swim for Health:' Programme Evaluation of a Multi-partner Exercise Intervention utilising Aquatic Exercise in the North of England, Interim Findings.**Evans, A. B.<sup>1</sup> and Sleep, M.<sup>1</sup><sup>1</sup>University of Hull, Kingston Upon Hull, United Kingdom

The Governing body for aquatic activity in the UK (the ASA) has initiated a number of health initiatives during the past two years. These initiatives are in response to modern health problems, including rising levels of obesity. Regular aquatic activity offers significant potential to reduce the prevalence of obesity, as it is affordable and widely available. 'Swim for Health' is a multi-agency partnership in two local authority districts in the North of England. It aims to decrease health inequalities in four key groups; pre-school children and their families, people in full time employment, people with a range of health needs, including obesity, and people aged over 50 years. The principal aim of this study was to evaluate the success of the 'Swim for Health' initiative in achieving its stated aims.

Methods were based upon a programme theory evaluation model. Attendance figures were analysed by session and by local authority. 82 Semi-structured interviews were completed with organisers, participants and non-participants. 269 Questionnaires were completed to augment interview data.

'Swim for Health' has increased aquatic participation in specific groups. Participants belonged to the intended groups, suggesting target populations utilised services as intended. Participants were largely female. Self-reported physical activity levels were higher in participants than non-participants. Perceptions of risk and of participants' bodies were key barriers to participation.

'Swim for Health' is meeting many of its aims, including increasing participation and offering a range of aquatic services. However, a number of weaknesses remain, particularly a failure to engage with male participants. Research relating to this Abstract was funded by The Department Of Health, United Kingdom, and the Amateur Swimming Association, United Kingdom.

## T5:PS.163

**Child obesity and the changes in projection of lengthwise axis and the axis of heel symmetry in obese children footprints.**Hlaváček, P<sup>1</sup>, Badurova, J<sup>1</sup><sup>1</sup> Tomas Bata University in Zlín, Czech Republic

**Introduction:** Statistical figures prove a heightened occurrence of children with alarmingly higher values of BMI. These trend is prevalently thought to be connected to low level of locomotive activity. Many expert analyzes refer about significant changes of the ankle between lengthwise axis and the axis of heel symmetry in obese children footprint. Reason for study was to confirm whether the changes of footprint axes correlate with BMI values.

**Methodology:** There were two groups of subjects in age 11 – 14 years. First group contained 14 children with BMI values in interval from 20 to 24. Another 14 children with BMI values in interval from 28 to 32 comprise second group of subjects. Average values of plantar pressure were evaluated and compared in six prearranged regions of suitable size of the shoe insole.

**Conclusion:** The results prove significant difference in loading pattern between two groups of selected subjects. Feet function changes are closely related to increasing values of plantar pressure load on children's feet.

## T5:PS.162

**The Efficacy of a Multifaceted Intervention Tool to Improve Obesity Documentation in an Outpatient Pediatric Clinic**

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The purpose of this study was to assess the impact of a multifaceted intervention to increase the recognition and treatment of overweight/obese children by physicians in an inner-city pediatric outpatient clinic. **Method:** Medical records of 268 children attending annual Health Care Maintenance visits were randomly selected and evaluated pre- and post-intervention to assess the presence of physician obesity/overweight diagnosis, laboratory work-up, and treatment recommendations. The intervention consisted of office posters, nurse lecture, physician workshop with self-audit exercise, and obesity algorithm tool.

**Results:** The intervention was overall effective in increasing documentation of weight-related issues (from 30.9% to 35.9%), however, it was mainly effective for the treatment of overweight/obese males. Specifically, documentation of nutritional discussion, TV discussion, and recommendations increased to the greatest degree following the intervention.

**Conclusions:** Although the intervention appeared overall slightly effective in increasing documentation of weight-related issues, it was more effective for documentation of overweight/obese males. Additionally, documentation of nutritional discussion, TV discussion, and recommendations increased following the intervention.

**Key words:** Children, Obesity, Documentation, Multifaceted Intervention tool.

## T5:PS.164

**Practical application of Protein-Rich Oriental (PRO) Diet in a community-based obesity control program in Korea**Joo NS<sup>1</sup>, Park YW<sup>1</sup>, Park GE<sup>2</sup>, Chang HM<sup>3</sup>,  
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**Background:** Protein-rich Oriental (PRO) diet is a modified protein-enriched diet program, which encourage to eat low-saturated fat, high protein Oriental food (legumes, soybean curd, soy milk, mushrooms, nuts, seafood, fish, chicken breast, and lean meat) and vegetables with avoiding simple sugars, refined starches, and high-saturated fats.

**Objective:** To investigate the effects of PRO Diet in 12 week community-based obesity control program.

**Methods:** Three hundred-two subjects (37 men, 265 women, mean age 41.92±9.83, BMI 28.02±3.14kg/m<sup>2</sup>) were participated in the community-based obesity program provided by 2 Public Health Centers. Weekly programmed PRO Diet programs were applied during 12 weeks. Participants were evaluated weekly or bi-weekly by trained nurses and dietitians. Short Message Services by using mobile phones were additionally provided for behavior modification.

**Results:** One hundred twenty-nine subjects (42.7%) completely satisfied the 12-week program. In a per protocol (PP) analysis, mean changes in body weight and waist circumference were -5.47±3.07kg (p<.001), -7.17±3.06cm (p<.001), respectively.

Triglyceride level at 12 weeks was significantly lower (-27.74±62.40, p<.001) than baseline. No serious adverse event was reported during the program, and the overall satisfaction index was high.

**Conclusion:** PRO Diet was effective tool to control weight and well-tolerated. PRO Diet is useful for community-based weight control.

**Key words:** Protein Rich Oriental Diet, community-based obesity program, Korea  
**Funding:** Research relating to this abstract was funded by Gyenggi provincial office

## T5:PS.166

**Changing children's diets: Call on the Food Dudes Programme**Lowe, C F<sup>1</sup>, Horne, P J<sup>1</sup>, Hardman, C A<sup>1</sup><sup>1</sup> Bangor University, Bangor, United Kingdom

Although eating fruit and vegetables is vital for health, children eat very little of these foods. In addition, their free time, traditionally spent in active play, is increasingly being spent in sedentary pursuits. Clearly, poor diet and low levels of physical activity contribute to the increasing prevalence of child obesity in many countries worldwide. Over the past fifteen years a learning programme has been developed that greatly increases children's consumption of fruit and vegetables. The innovative programme, which uses video heroes (the Food Dudes) and small rewards to influence children to taste the foods, has been put to test in homes, schools and nursery settings. The present paper outlines the results of a series of studies that investigate a whole-school version of the Food Dudes programme, designed to be effective across the age range of any primary school (i.e., 4-11 years) and to be implemented by school staff. The research has been conducted in schools in England, Wales and Ireland. The results show that with a modest investment of resources, it is possible for Governments to bring about major and long-lasting improvements to school children's diets. The Irish Government has recently become the first to roll out the Food Dudes Programme on a national scale. The Food Dudes approach has also been applied to physical activity (the Fit 'n' Fun Dudes programme). Future research will combine the healthy eating and physical activity approaches, and an intervention of this nature is likely to play a key role in tackling child obesity.

**Funding:** Research relating to this abstract was funded by the Horticultural Development Council, Fresh Produce Consortium, Tesco, Sainsbury, Safeway, Co-operative Wholesalers' Society, Asda, Somerfield, Food Standards Agency Wales, Fyffes and Bord Glas.

## T5:PS.168

**The Impact Of The Meaning Of Obesity In Thulamela Vhembe District Limpopo Province South Africa.**

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South African black communities do not always view obesity as being negative and unacceptable. In the researcher's lived experience, indigenous communities interpret obesity as a sign of affluence and of being well fed. What appeals to the public eye regarding obesity vary with cultures and with time. Obesity has reached epidemic levels worldwide. The World Health Organization reported that Southern African countries are particularly affected by this epidemic. There is a discrepancy between perceived and actual weight with most black people accepting bigger bodies as a normal weight. The purpose of the study was to assess the meaning of obesity from a cultural perspective. Also included was to determine how the understanding of obesity influenced the national health strategy to reduce obesity in Thulamela Vhembe district. An exploratory survey study was done using self-report as data gathering method. Data were collected using a questionnaire and focus groups from community members in Thulamela. The data were analysed through descriptive statistics and content analysis. The results indicate that the community members, including health care workers, have a total lack of risk perception in terms of obesity and that any invention to reduce weight should be multi-faceted and must include raising awareness of risks related to obesity. Conclusion: Obesity interventions are challenging and without understanding the full scope of the problem, interventions are bound to fail. A multi-disciplinary and community-specific approach should be used. 1. Conflict of Interest: None Disclosed 2. Funding Research relating to this abstract was funded by Tshwane University of Technology.

## T5:PS.167

**Reproducibility and within-day variability of body fat measurements using segmental bipolar bioelectrical impedance in women.**

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**Objective:** to assess the between and within-device reproducibility, as well as within-day variability of body fat measurements.

**Methods:** body fat percentage (%BF) was measured twice on seventeen female students aged between 18 and 20 with a body mass index of  $21.9 \pm 22.6 \text{ kg/m}^2$  (mean  $\pm$  SD) using seven bipolar bioelectrical impedance devices (BF-306) according to the manufacturer's recommendations. Each student was also measured each hour between 7:00 and 22:00. Statistical analysis was conducted using a general linear model for repeated measurements.

**Results:** the correlation between first and second measurements was very high (Pearson  $r$  between 0.985 and 1.000,  $p < 0.001$ ), as well as the correlation between devices (Pearson  $r$  between 0.986 and 0.999, all  $p < 0.001$ ). Repeated measurements analysis showed no differences were between devices (F test=0.83,  $p=0.59$ ) or readings (first vs. second: F test=0.12,  $p=0.74$ ). Conversely, significant differences were found between assessment periods throughout the day, measurements made in the morning being lower than those made in the afternoon. Assuming an overall daily average of 100 (based on all measurements), the values were  $95.8 \pm 3.2$  (mean  $\pm$  SD) at 8:00 versus  $101.3 \pm 3.0$  at 20:00, corresponding to a mean change of  $2.2 \pm 1.1$  in %BF (F test for repeated values=6.58,  $p < 0.001$ ).

**Conclusions:** the between and within-device reproducibility for measuring body fat is high, enabling the use of multiple devices in a single study. Conversely, small but significant changes in body fat measurements occur during the day, urging body fat measurements to be performed at fixed times.

## T5:PS.169

**Scottish GPs attitudes towards obesity prevention.**Riddell, R<sup>1</sup>, Aucutt, L<sup>1</sup><sup>1</sup>University of Aberdeen, Aberdeen, Scotland, UK

Obesity prevalence in Scotland continues to rise, being the highest in Europe. General practitioners (GP) provide primary care services to 97% of the Scottish population. An average patient will attend four times a year. There are 1094 practices in Scotland.

Prevention of obesity and overweight is receiving growing attention. GPs attitudes towards obesity prevention are not well documented.

After gaining ethical approval, a postal survey of all GP registrars and GP trainers throughout Scotland was undertaken in 2006/2007.

GP registrars are doctors completing the final year of specialist training. The questions covered doctors' individual details, current opinions and practices.

Additionally, the final section sought free text comments.

The overall response rate was 51.8%. Doctors from 102 or 9.3% of all Scottish practices responded. Both groups agreed that obesity is an important medical condition.

Differences exist for whether primary care can or should help with obesity prevention.

Overall both groups believe that individual change is of most importance and screening in primary care least important in preventing obesity. Free text answers were provided by 90% of respondents, verified the roles of the individual and society, but that obesity prevention should be non-medicalised.

Scottish trainers and registrars believe obesity and its prevention are important. Individual behavior change, with respect to diet and exercise within a societal context are considered important. This is very much in keeping with the approach in England by the Foresight project. There appears to be a reluctance for GPs to become actively involved with obesity prevention.

Please note that EASO encourages full disclosure of all relevant sources of funding in relation to abstracts submitted to this congress. If you wish to disclose a conflict of interest or any funding, please do so briefly at the foot of this abstract as follows:

## T5:PS.170

**Increase in Body Mass Index during the 6<sup>th</sup> age decade of life – relationship with life-style and co-morbidities**Dzien A<sup>1</sup>, Dzien- Bischinger C<sup>1</sup>, Wagner H<sup>1</sup>, Lechleitner M<sup>2</sup><sup>1</sup>Medical Center Innsbruck; <sup>2</sup>KH Hochzirl, Innsbruck

**Background:** The prevalence of cardiovascular and metabolic disease increases with increasing age. We were interested in the relationship of an increase in Body Mass Index (BMI) during the 6<sup>th</sup> age decade of life to dietary regimens, smoking, physical activity, as well as to cardiovascular and metabolic disease.

**Methods:** During a period of 2 years 665 patients in the 6<sup>th</sup> age decade attended our medical center. 457 of them (age 52.4±18.0 years) revealed a BMI of 20-24.0 kg/m<sup>2</sup>, 208 (age 59.4±14.0 years) a BMI of ≥25 kg/m<sup>2</sup>. 108 of all of the patients revealed an increase in BMI. A questionnaire about nutrition and physical activity in daily life was part of the routinely performed clinical and laboratory measurements at the initial visit, as well as the smoking status.

**Results:** Patients with an increase in BMI revealed an increase in the number of cardiovascular and metabolic diagnosis from 1.9 in each patient to 2.9 within the observation period. This was paralleled by an increase in blood pressure values and fasting glucose levels, and a worsening of dyslipidemia. 51% of these patients reported to be physically inactive with less than 2.5 hours of activity per week. 43% were active smokers. Compared to patients with stable BMI patients with an increase in BMI showed a higher intake of alcoholic and soft drinks, as well as carbohydrates with high glycemic index, but no difference in fat intake.

**Conclusion:** Life-style recommendations including a more detailed information about the intake of carbohydrates should be offered to the middle-aged population.

## T5:PS.172

**Weight gain and its related factors in pregnant women of Tehran**Mohammadi M<sup>1</sup>, Mohammadi F<sup>2</sup>, Fadavi Gh<sup>3</sup><sup>1</sup>Faculty of Nursing and Midwifery, Shaheed Beheshti University of Medical Sciences, Tehran, Iran<sup>2</sup>National Nutrition and Food Technology Research Institute (NNFTRI), Tehran, Iran  
<sup>3</sup>Standard and Industrial Research Institute, Karaj, Iran

**Background & Aims:** A weight gain during pregnancy that is more than the upper limits recommended is associated with postpartum weight retention and overweight/obesity in later life. Assessing the weight gain in pregnant women and its related factors can contribute to the prevention of overweight and obesity as major risk factors of non-communicable disease.

**Materials & Materials:** This study was a descriptive-analytical study with quota sampling based on the aim. The sample size were determined 265 pregnant women as clients of prenatal care clinics of Shaheed Beheshti University of Medical Sciences based on number of daily clients of each hospital. Instrument for data gathering was a questionnaire including demographic, personal, socio-economic data and pregnancy history which was completed by expert interviewers through structured interviews. Mothers' height and weight were measured and BMI (Body mass index) were computed. Pre-pregnancy weight was obtained from the historical files. Statistical analysis was done by using SPSS, Chi-squared, student and paired t-test, pearson correlation and logistic regression.

**Findings:** Most of the studied population (69.5%) was in 20 – 30 years old age group, were housewives (83.4%), had diploma (49.1%) and experienced their first pregnancy (47.6%). More than half of them were normal weight, 17% were underweight, 17% were overweight, and 12.8% were obese. Mean of weight gain based on gestational age was not different from recommended level. However, mean of weight gain in overweight (9.97±6.06 vs. 6.63±1.47kg, p<0.001) and obese (9.61±6.35 vs. 6.0kg, p<0.01) groups was significantly higher than recommended level. Weight gain in pregnant women was correlated with extent of house (r=0.13, p<0.05) and monthly income (r=0.18, p<0.01). Pre-pregnancy weight status was correlated with age (p<0.01), education, pregnancy times, number of children, time interval between two pregnancies, family size and occupation of husband (p<0.05). Logistic regression showed that overweight/obesity decreased 0.14 times with employment of mother (CI: 0.05-0.36, p<0.001) and increased 1.29 times with age (CI: 1.14-1.47, p<0.001).

**Conclusion:** Monitoring weight gain during pregnancy, healthy eating recommendations and informing about the proper weight gain are the main strategies for preventing post partum overweight/obesity especially in obese and older women.

**Key words:** Pregnant women, Weight gain, Socio-economic status, Overweight, Obesity  
Research relating to this abstract was approved by Endocrine Research Center of Shaheed Beheshti University of Medical Sciences.

## T5:PS.171

**Adapting risk analysis methodology to obesity prevention: Lessons learned from Denmark and Latvia**Knai, C<sup>1</sup><sup>1</sup>London School of Hygiene & Tropical Medicine, London, United Kingdom

It is widely acknowledged that the origins of obesity extend beyond individual behaviour to encompass obesogenic environments. This research aimed to understand decision-making on childhood obesity in Latvia and Denmark.

Traditional risk analysis was expanded to take into consideration socioeconomic, political, and other non-scientific factors ('framing assumptions'). Stakeholder analysis was used to assess the positions taken and influence held by different stakeholders with regard to soft drink consumption as a risk factor for childhood obesity, and to capture important framing assumptions when analysing the response to soft drink consumption and childhood obesity in each country.

The framing assumptions included issues such as the dynamics of stakeholder relations and the perceived legitimacy of State action; the implications of public-private alliances and politico-economic transition; issues around childhood obesity, such as the extent to which it is on the public agenda; and issues around soft drink consumption, such as the perceived role and effectiveness of a soft drink tax and the sales of soft drinks in schools.

Building a mechanism to analyse risk will help recognise and address framing assumptions and the various parameters respective to each country, thereby contributing to the global effort to curb the obesity epidemic and associated conditions.

**Funding:** Research relating to this abstract was funded by the Economic and Social Research Council (UK)

## T5:PS.173

**EPODE European Network: Integrative approaches on lifestyles to prevent childhood obesity**

Borys, JM, Peze, K, Le Bodo, Y, Lommez, A, Bordas, S, Mugnier, S, Raffin, S

EPODE coordination team, 11 rue Galvani, Paris, France

The objective is to curb the progression of childhood obesity through a methodology that establishes prevention at the heart of the city networks, mobilizing local stakeholders and empowering families and individuals in a sustainable way.

This approach is set up in 150 cities in 3 European countries. Success to date is measured by a large field mobilization in the pilot cities and by the encouraging evolution of the BMI of children.

The EPODE European Network (EEN) is designed to bring together expertise in the design, delivery and evaluation of similar community based intervention projects. The Network, created and coordinated by the EEN Team, is structured around a board and four committees concerning scientific evaluation and dissemination, public/private partnership, political involvement and social marketing techniques. This 3-years pan European program should particularly lead to various communications and publications in peer reviews leading to the production of a final methodology book to be used for the implementation of EPODE-like programs in other European countries.

The objective is also to stimulate relevant stakeholders – i.e. political representatives, city and regional structures, national public health agencies, private stakeholders - to commit themselves in implementing effective local strategies and thus contributing to the EU vision of a multi-stakeholder partnership united in its determination to improve diet and activity habits and to prevent obesity and other chronic diseases. The EEN project will particularly work on building the legal and ethical framework of the public/private partnership.

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## T5:PS.174

**Behavioral-cognitive obesity treatment**Lančić, F<sup>1</sup>, Jureša, V<sup>2</sup>, Jurisa, A<sup>2</sup><sup>1</sup>Public Health Institute Varazdinska County, Croatia<sup>2</sup>Andrija Štampar School of Public Health Medical School University of Zagreb, Croatia**Context:** According to behavioral theory obesity is a result of overeating as a learning process.**Goal:** The goal of the treatment was: awareness of eating habits, controlling the eating habits, adopting healthy eating habits and everyday physical activity, reducing body weight for 5% in 6 months, reducing waist line**Methods:** Body weight and height, Body mass index, blood pressure, waist and hip line were measured before the treatment. Also laboratory tests and behavior-cognitive interviews were conducted. The treatment consisted 15 sessions, 8 sessions once a week, 4 twice a month and 3 once a month. Different techniques were used: Behavioral (self observing, behavior testing, operative conditioning, distractions, and coping cards), cognitive (cognitive restructuring, problem solving, positive self statements), relaxational (abdominal breathing, imagination).**Results:** Healthy eating knowledge was improved and waist line was reduced from 112 cm to 108 cm. Healthy eating attitudes and everyday physical activity was partially accomplished. Reducing the body weight was not accomplished at the end but in the middle of treatment body weight was dropped.

## T5:PS.176

**Dietary habits in the caribbean basin and central and south America**

R Visser

Simply Give Health LLC &amp; Richard Visser Institute - Not For Profit Foundation

Large numbers of health organizations, groups of experts, and nutritionists are looking with increasing concern at the spread of obesity and obesity-related noncommunicable chronic health problems throughout the Caribbean Basin and Central and South America. The region has enjoyed unprecedented economic growth as a result of what has been called the “smokeless economy”—increased international tourism together with unparalleled advancement in communications technology and the specialized services industry. This economic boom has also led to the development of new dietary habits typical of so-called First World societies, which are largely replacing traditional regional diets. The obesity resulting from this “overnourishment” goes hand in hand with severe nutrient deficiencies, ranging from a lack of specific micronutrients such as iron and vitamin A to outright malnourishment. The author provides an overview of the current situation and offers policies and recommendations in an attempt to promote successful intervention. A significant impact on the current situation can only be made through joint effort by government authorities, health officials, professionals, and the population in general.

*DeCS Subject Headings: Obesity, Food Habits, Noncommunicable Chronic Illness, Caribbean Basin, Central America, South America.*

## T5:PS.175

**Obesity and the Regulatory Environment**Loff, B<sup>1</sup><sup>1</sup> Monash University, Melbourne, Australia

The study of the relationship between obesity and the “law” tends to be limited to fairly standard matters such as food advertising, food safety, controlling the availability of energy dense foods in schools and perhaps determining the potential role of litigation.

If the law is to be properly considered, it is necessary to first gain a real understanding of the breadth of available regulatory tools at one’s disposal and how they may be used to address obesity. Such tools may range from international agreements to local codes and contracts.

In this paper we describe our use of the term “regulatory environment” and how, as lawyers working in association with public health practitioners, we have attempted to identify and prioritise non public health, non clinical approaches to address obesity.

**Funding:** Research relating to this abstract was funded by the Australian National Health and Medical Research Council.

## T5:PS.177

**Obesity prevention in school: what is the opinion of the actors?**Bucher Della Torre, S<sup>1</sup>, Akre, C<sup>1</sup>, Suris Granell, J-C<sup>1</sup><sup>1</sup> Research group on adolescent health, Institute of social and preventive medicine, University of Lausanne, Switzerland.

The number of children at risk for or already overweight is increasing and constitutes a serious public health concern. In Switzerland, 17% of boys and 19% of girls six to twelve years old are overweight, and 4% are obese. School-based programs aiming to prevent obesity in children and adolescents are based on behavior changes related to healthier eating habits and more physical activity. Successful programs are often from Anglo-Saxon countries and we don’t know how applicable they are in the Swiss context. As the Canton de Vaud is developing a program for the promotion of physical activity and healthy eating, the objective of this study is to assess the school stakeholders’ perception about the acceptability and feasibility of obesity prevention strategies that could be implemented in schools, and to identify alternative strategies that these actors would propose.

Participants will be recruited in several schools in Canton de Vaud (Switzerland) between October and December 2007. Focus groups including 6 to 10 people will be organized with 1) school directors, 2) teachers and physical education teachers, 3) people linked to school restaurants, 4) school doctors and nurses and health teachers, 5) parents of young adolescents (11-12 years old), and 6) young adolescents (11-12 years old). Discussions will be recorded, transcribed and analyzed in accordance with qualitative research methods.

A final report with recommendations is due by the end of March and the results and recommendations that emphasize strategies that ensure maximal success for planned interventions will be presented at the Congress.

**Conflict of interest:** None disclosed.

**Funding:** This research is funded by the Public Health Service of the Canton de Vaud.

## T5:PS.178

## Parental gender differences in the estimation of their offspring's dietary intake

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**Objective:** To assess parental gender differences in the estimation of the dietary intake of their offspring.

**Methods:** The study was performed in a convenience sample of 1976 subjects. Children's height and weight were measured and body mass index (BMI) was calculated. Children's caretakers completed a self-administered questionnaire, which provided information on family background characteristics, including dietary intake, using a food frequency questionnaire. Unconditional logistic regression models were fitted to estimate the magnitude of the association between children's food consumption and respondents (mother or father), adjusting for confounders (age, BMI, energy intake, and parental education).

**Results:** Higher consumption of vegetable soup was more frequently reported by mothers compared to fathers in girls (OR = 1.51, 95% CI 1.09 - 2.10, p = 0.010) and boys (OR = 1.63, 95% CI 1.06 - 2.29, p = 0.005), but after adjusting for confounders the association remained statistically significant only in boys (OR = 1.63, 95% CI 1.11 - 2.39, p = 0.013). Higher intake of fruit was also more frequently reported by mothers than fathers in girls (OR = 2.05, 95% CI 1.46 - 2.87, p < 0.001) and boys (OR = 1.48, 95% CI = 1.06 - 2.07, p = 0.020), even after adjusting for confounders (OR = 2.04, 95% CI 1.40 - 2.98, p < 0.001, in girls, and OR = 1.53, 95% CI 1.04 - 2.26, p = 0.030, in boys).

**Conclusion:** Compared to fathers, mothers tend to report higher consumption of vegetable soup in boys and fruit in both genders.

## T5:PS.181

## Socioeconomic and behavioural correlates of overweight among South Mediterranean adolescents (Tunisia)

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**Introduction:** Obesity in adolescence is becoming a public health concern in developing countries. However, few data are available concerning its prevalence and related factors. This study aimed at assessing the overweight prevalence of adolescents and its correlated factors in Tunisia.

**Methodology:** This cross-sectional study, based on a multistage stratified random cluster sample, representative of 3 contrasted socioeconomic regions in Tunisia, was carried out in 2005 on 1019 adolescents aged 15-19 years. Socioeconomic characteristics, anthropometric measures, food consumption (from which diet patterning and quality index were derived) and physical activity behaviour characteristics were recorded during home visits. Multivariate analysis was performed to identify overweight's correlates.

**Results:** Prevalence of overweight (>=85<sup>th</sup>perc), and obesity (>=95<sup>th</sup>perc) (NCHS-WHO reference) were respectively 18.9% and 4.3% (15.2% and 2.6% - IOTF definition). Prevalence of overweight increased significantly by socioeconomic level of region (from 3.7% to 22.9%) and was higher in urban (21.5%) than rural areas (8.1%) for boys; whereas no significant difference was found for girls. Overweight was related to diet structure and quality for boys only. After adjustment, overweight was positively associated to living in an urban area, higher educational level of the mother, sedentary lifestyle and irregular afternoon snacking, for boys. It was positively related to school dropout and the higher level of mother's education for girls.

**Conclusion:** Overweight in late adolescence has become a true public health problem in Tunisia. Girls were exposed equally to overweight in rural and urban areas whereas it was more related to the westernization of lifestyle for boys.

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## T5:PS.180

## An Examination of the Association of Heavy Metals with Weight Gain/Obesity: NHANES 99-02

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Recent evidence suggests that body chemistry imbalance can cause energy deficiency which consequently leads to weight gain/central fat. Heavy metals may play a role in causing obesity by displacing vital minerals such as zinc and copper, which in turn may affect energy production, carbohydrate tolerance, and other aspects of physiology. We examine the association between waist circumference (WC), and body mass index (BMI), with selected heavy metals. Approximately 4200 NHANES 99-02 participants were used. Linearity was improved by taking the natural log of each heavy metal. Heavy metals investigated were barium, cadmium, cobalt, cesium, molybdenum, lead, antimony, thallium, and tungsten. BMI was regressed on gender, ethnicity, age, creatinine, heavy metals, and gender by heavy metals. Main effects were found for barium (p=.0189), cadmium (p=.0429), cesium (p=.0004), lead (p<.00005), and thallium (p=.0062) along with a gender by cesium (p=.0402) interaction. When WC was regressed on the same variables, main effects were found for barium (p=.0255), cesium (p=.0002), molybdenum (p=.0018), lead (p=.0000), and thallium (p=.0071) along with a gender by cesium (p=.0414) interaction. There are positive associations for barium and thallium with BMI and WC. The association is reversed for lead and cesium with BMI and WC. However, the cesium relationship is stronger for females than males. Environmental exposure to heavy metals may burden the human body with toxicity as well as weight gain and hence obesity.

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## T5:PS.182

## Improvement in quality of life in obese patients is independent of weight loss

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Besides weight loss, quality of life (QL) is another measurement of treatment impact. If QL depends only on weight loss could be considered as surrogate and in this case could lose significance. This study investigated the relation between QL score and weight loss. The time of permanence in follow up was considered another variable of interest for QL assessment.

We used the IWQOL (Impact of Weight on Quality of Life) developed in the University of Duke. It has 8 areas, validated by our team.

We included 69 patients, 55 with complete data (44 women and 11men). Age 44.5±9.5 yo, BMI 38±5.8, waist circumference 107.2±13.13 cm and mean follow up using Kaplan-Meier was 7±0.4 months.

Changes in QL and correlation with weight change:

Area	Improvement in QL (IC 95%) (p)	Correlation with weight reduction (p)
Health	5.6 (3.6-7.7) (<0.001)	-0.10 (0.46)
Food enjoyment	2.3 (1.0-3.6) (<0.001)	0.044 (0.75)
Personal	3.7 (2.4-5.0) (<0.001)	-0.072 (0.60)
Labour	1.8 (0.3-3.3) (<0.05)	-0.09 (0.52)
Physical activity	5.8 (3.7-7.9) (<0.001)	0.07 (0.63)
Social	3.2 (1.7-4.6) (<0.001)	-0.052 (0.71)
Sexual	2.4 (1.2-3.6) (<0.001)	0.13 (0.34)
Self-confidence	3.4 (1.9-4.9) (<0.001)	-0.04 (0.78)

Fifty percent of conditioned success weight lost of 5 or 7% using Kaplan-Meier analysis was obtained at 6.3 months.

We concluded obese subjects with BMI >30 improved the QL score independently of BMI decrease and the time of follow up at the clinic.

To obtain at least 50% of conditional success in weight loss patients should be maintained in treatment for more than 6 months.

## T5:PS.183

**Relationship between body mass index and perception of body weight in Lithuanian adult population**Kriaucioniene, V<sup>1</sup>, Petkeviciene, J<sup>1</sup>, Klumbiene, J<sup>1</sup><sup>1</sup>Institute for Biomedical Research, Kaunas University of Medicine, Kaunas, Lithuania**Purpose:** To assess the relationship between body mass index and self-perception of body weight among Lithuanian men and women.**Methods:** In 2004 the cross-sectional survey was carried out within the international Finbalt Health Monitor project. A national random sample of 3000 inhabitants of Lithuania aged 20-64 has been taken from the National Population Register. The study material was collected by mailed questionnaires. Response rate was 61.7%. The participants self-classified their own weight as normal, below or above normal. Body mass index (BMI) was calculated based on self reported weight and height.**Results:** The prevalence of obesity (BMI $\geq$ 30 kg/m<sup>2</sup>) was 14.2% among men and 16.9% among women. The proportion of overweight men (BMI 25-30 kg/m<sup>2</sup>) was 38.5% and proportion of women - 33.2%. Perception of own weight differed by sex. Women having normal weight tended to overestimate it (28.7%) while normal weight men tended to underestimate their body size (23%). Overweight women evaluated their weight properly more often than overweight men did (72% and 41% respectively). Most of obese men (82%) and women (92.8%) classified their weight correctly. Low proportion of men and women (3.8% and 2.5% respectively) couldn't manage to evaluate their weight. Overweight persons who properly evaluated their body size reported attempts to reduce their weight more often if compare with the under reporters.**Conclusions:** Obesity and overweight are widely prevalent in Lithuania. Predominantly among men there is a tendency to underestimate their body weight with respect to actual body mass index.

## T5:PS.185

**Prevalence of normal weight obesity in the general population**Marques-Vidal, P<sup>1,2</sup>; Chiolero, A<sup>2</sup> and Paccaud, F<sup>2</sup><sup>1</sup> Cardiomet, CHUV, Lausanne, Switzerland; <sup>2</sup> Institute of Social and Preventive Medicine (IUMSP), University of Lausanne, Switzerland**Background and Aims:** normal weight obesity (NWO) has been defined as an excessive body fat (BF) associated with a normal body mass index (BMI). Little is known regarding its prevalence in the general population or which cut-offs for BF should be used.**Methods:** convenience sample of 1,523 Portuguese adults. BF was measured by validated hand-held bioimpedance. NWO was defined as a BMI $<$ 25 kg/m<sup>2</sup> and a %BF mass $>$ 30%, along other published criteria.**Results:** prevalence of NWO was 10.1% in women and 3.2% in men. In women, prevalence of NWO increased considerably with age, and virtually all women aged over 55 with a BMI $<$ 25 kg/m<sup>2</sup> were actually considered as NWO. Using gender specific cut-offs for BF (29.1% in men and 37.2% in women) led to moderately lower of NWO in women. Using gender- and age-specific cut-points for %BF considerably decreased the prevalence of NWO in women (0.5 to 2.5% depending on the criterion) but not in men (1.9 to 3.4%).**Conclusions:** gender- and age- specific or at least gender-specific, instead of single cut-offs for %BF, should be used to characterize and study NWO.

## T5:PS.184

**Obesity indices and central obesity in Greek Primary School-Children. Relation to eating habits and television viewing**Kyriazis A. I.<sup>1</sup>, Zervas E.<sup>2</sup>, Fortis A.<sup>1</sup>, Mytas D.<sup>2</sup>, Lalouis A.<sup>2</sup>, Diakoumopoulos A.<sup>2</sup>, Christodoulou G.<sup>2</sup>, Katsare Z.<sup>2</sup>, Klimatsaki K.<sup>2</sup>, Pavlidou Ch.<sup>1</sup>, Deda E.<sup>2</sup>, Katsilambros N.<sup>3</sup><sup>1</sup>Obesity Outpatient Clinic - Korinthos General Hospital , Korinthos Greece; <sup>2</sup>Internal Medicine Dpt. Korinthos General Hospital , Korinthos , Greece; <sup>3</sup>1<sup>st</sup> Propedeutic Department of Internal Medicine, University of Athens, "Laikon" General Hospital, Athens, Greece.**Introduction:** Childhood obesity is one of the most important public health concerns in developed countries.**AIM:** To determine the prevalence of total and central obesity (CO) in Greek primary school age children(GPSC) and their relationship with eating habits and other determinants.**Materials and Methods:** 1399 GPSC(706 boys and 693 girls),6-12 years were surveyed. Body mass index and waist circumference cut-off values were used. Parental questionnaires asked, among others, for children's eating and lifestyle habits were filled in.**Results:** Among the entire study population overweight was 23,9%, obesity 7,3% and CO 35,5%.Boys were more obese than girls(9,2% vs 5,3%, p $<$ 0,05) but CO was equal in 2 sexes(36,6% vs 34,3%, p=0,48).Obesity reduced significantly as age increased(from 10,3% in age 6-9 to 3,3% in age 10-12, p $<$ 0,001), but not CO(33,5% in age 6-9, 33,7% in age 10-12, p=0,18). Junk food(JF) consumption was associated with increased CO(27,8% no, 36,4% 1/week, 42,6%  $>$ 2/week, p $<$ 0,05) but not with the other obesity indices. Children's healthy eating in school linked to lower percentages of total and central adiposity(CO 32%, overweight/obese 27,8% vs CO 38,6%, overweight/obese 34,1%, p $<$ 0,05). Television viewing related to an increase in all obesity indices(infrequent viewing: CO 31,4%, overweight/obese 26,9% vs frequent viewing:CO 44%, overweight/obese 39,7%, p $<$ 0,05)**Conclusions:**Our study demonstrates a high prevalence of overweight and CO among GPSC.There was also a significant correlation of CO with the frequency of JF consumption and the time of TV/PC usage.Certain aspects of eating habits seems to associated with obesity in our population, giving us a field of preventing interventions.

## T5:PS.186

**Influence of educational level on consumption of breakfast, fruits and vegetables.**P Mullie<sup>1</sup>, M Hulens<sup>2</sup>, P Clarys<sup>3</sup>, G Vansant<sup>1</sup><sup>1</sup> Department of Nutrition, Preventive Medicine, Catholic University Leuven, Belgium<sup>2</sup>Department of Rehabilitation Sciences, Research Center for Musculoskeletal Rehabilitation, Catholic University Leuven, Belgium<sup>3</sup> Faculty of Physical Education and Physiotherapy, Laboratory for Human Biometrics and Biomechanics, Vrije Universiteit Brussel, Belgium

Dietary patterns are associated with sociodemographic factors such as the level of education. A lower level of education has been associated with a less healthy diet.

The aim of this study was to determine the breakfast frequency and the fruits and vegetables consumption in adolescents. Male (n = 1390) and female (n = 3610) adolescents aged 12 to 15 years completed a short questionnaire concerning their eating habits. Data were operationalized in: never having breakfast versus one or more breakfast(s) a week, never eating fruits versus one or more portion(s) a day and never eating vegetables versus one or more portion(s) a day. Educational system was stratified in general versus technical/occupational system.

13.9% (n = 510) of the adolescents following general educational system never consumed a breakfast, compared with 25.9% (n = 265) in technical/occupational system (chi<sup>2</sup> with one df = 82.98; p $<$ 0.001). Respectively 21.7% (n = 773) and 18.4% (n = 695) of the adolescents in general education never consumed fruits or never consumed vegetables, compared with 30.4% (n = 314) and 29.7% (n = 332) of the adolescents from technical/occupational education (chi<sup>2</sup> with one df=33.15; p $<$ 0.001 for fruits and chi<sup>2</sup> with one df = 65.67; p $<$ 0.001 for vegetables).

Breakfast frequency is lower and intake of fruits and vegetables are less frequent among adolescents of lower educational systems compared with adolescents of higher educational systems. Interventions aiming to improve eating habits of adolescents should focalize on lower educational levels, using appropriate instruction material.

## T5:PS.187

**Adaptation of gait parameters in overweight women during outdoor uphill and downhill walking assessed by high accuracy GPS.**DMT Nguyen<sup>1</sup>, V Lecoultré<sup>1</sup>, A Hills<sup>2</sup> and Y Schutz<sup>1</sup><sup>1</sup> Department of Physiology, University of Lausanne, Switzerland<sup>2</sup> Institute of Health and Biomedical Innovation, Queensland University of Technology, Australia

**Introduction:** During free-living unconstrained walking, the gait parameters (GP), such as walking speed, step frequency (SF) and step length (SL), are influenced by various environmental conditions. In this study we explored body oscillations in 3 axes and determined GP of overweight women while walking at different slopes.

**Methods:** 23 control (C) (60±9 kg, BMI=22±2 kg/m<sup>2</sup>) and 22 overweight (OW) (88±15 kg, BMI=32±6 kg/m<sup>2</sup>) women walked at their spontaneous speed along a 2.5 km outdoor circuit with variable slopes (-18% to +18%). Assessment of body oscillations was performed by differential GPS (sampling at 20Hz, with subcentimeter accuracy). The SF was computed by Power Spectrum Density Analysis. The SL was calculated as the distance/# steps and the walk ratio (WR) as SL/SF. The change in GP was calculated using walking on the level as baseline.

**Results:** From -18% to +5% slopes, the change in GP was not significantly different between the C and the OW. Above +5% slope, the SF decreased more in OW as compared to C whereas no significant difference in SL change was observed. As a result the WR increased significantly more in the former compared to values while walking on level: WR increased by 5.6% and 6.4% at +10% and +15% slope, respectively, versus less than 1% increase in C.

**Conclusion:** Adaptation in GP in overweight individuals walking on steeper positive slopes relies more in a reduction in SF than in SL, allowing individuals to moderate walking speed accordingly.

## T5:PS.189

**Comparison of Malnutrition Status Of Under 5-Year Children of East Azerbaijan state with Total under 5-year Children in Iran.**

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**Introduction:** Nowadays obesity is a basic problem in society health, especially in children. In Iran, nutrition transition has led to increase of obesity prevalence in children, nonetheless stunting and underweight remained as a problem too. These problems are considerable even in affluent states of Iran like East Azerbaijan state (E.A.S). So the aim of this study is determination of malnutrition status of under 5-year children of E.A.S and comparison with the whole under 5-year children in Iran.

**Materials and methods:** Study design was observational-cross sectional. Samples collected with systematic cluster method. Sample size for the whole Iran (28 states) and for E.A.S was 7158 and 334 households, respectively. Weight and height was measured with standard methods and recorded to nearest 100g and 0.1 cm, respectively. Then weight for height, weight for age, height for age Z scores was calculated. Data were analyzed by MACCESS, MESXEL and SPSS (version 11.5) software.

**Results:** The prevalence of moderate and severe underweight and stunting (WAZ and HAZ <-2SD NCHS/CDC/WHO) of E.A.S in comparison with the whole Iran was 11% in contrast with 10.4% and 15.4% in contrast with 11.4%, respectively and the prevalence of obesity (WHZ >2SD NCHS/CDC/WHO) was 4% in contrast with 2.8%.

**Conclusion:** Findings suggest that despite of the higher prevalence of obesity of E.A.S in comparison with the whole Iran, underweight and stunting is higher than the mean of whole Iran too. So, planning for improvement of consumption pattern's quality of less than 5 years old children of E.A.S is necessary.

**Key words:** malnutrition, under 5 year children, East Azerbaijan state, Iran.

## T5:PS.188

**Growth charts for Czech child population and their comparison with new WHO growth standards**Paulová, M<sup>1</sup>, Vignerová, J<sup>1</sup>, Lhotská, L<sup>2</sup><sup>1</sup> National Institute of Public Health, Prague, Czech Republic<sup>2</sup> Geneva Infant Feeding Association, Geneva, Switzerland

The conclusion that breastfeeding alone is inadequate to meet nutritional needs of an infant < 6 months may be inaccurate if the growth charts used for the growth assessment represent incorrectly physiological growth pattern of breastfed children.

Aware of this problem, the World Health Organisation (WHO) has developed new international growth standards, based on the breastfed infant as a normative model. WHO now recommends implementation of these standards at national level, stressing, among others, their use for early detection and prevention of obesity.

In our study we compared Czech national growth charts for children 0-2 years (based on Nationwide Anthropological Survey 1991 and 2001) with the new WHO standards.

Table: Differences in values for 50th percentile for length and BMI between the Czech reference and WHO standards.

Age (y:m)	Boys		Girls	
	50th percentile			
	Length (cm)	BMI (kg/m <sup>2</sup> )	Length (cm)	BMI (kg/m <sup>2</sup> )
0:0	0.66	0.53	0.73	0.02
0:6	1.21	-0.69	1.09	-0.65
1:0	1.07	0.66	1.09	0.69
2:0	1.56	0.46	1.56	0.42

**Conclusions:** 1/ In case of national implementation of the WHO standards, we remain concerned about over reporting in length for majority of children and its likely effect on the assessment of all related characteristics.

2/ We are concerned about the impact of the significantly different trajectory for infants < 6 months in the WHO charts when used in practice.

3/ The use of the WHO charts for BMI may contribute to prevention of overnutrition and obesity in Czech Republic.

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## T5:PS.191

**Obesity, mortality and mobility in Chilean elders**Albala, C<sup>1</sup>, Lera, L<sup>1</sup>, Hugo Sánchez<sup>1</sup>, Garcia, C<sup>1</sup>, Herrera, R<sup>2</sup>, Arroyo, P<sup>2</sup>.<sup>1</sup>Institute of Nutrition and Food Technology (INTA)/University of Chile, Santiago, Chile<sup>2</sup>Clinic Hospital, University of Chile, Santiago, Chile

**Objective:** To determine the association of obesity with functional limitation and mortality in elders

**Methods:** Follow up of the Santiago SABE survey done in 2000 in 1202 subjects aged 60 and older residing in Santiago Chile. In 2000 all the subjects completed home interviews including history of chronic diseases, self reported disability/functional limitations, observed physical performance, anthropometry and functional measurements as handgrip strength and blood pressure. In 2005, 59.4% of the original group was interviewed, 20.7 % were died and 19.9% were lost to follow-up. Mortality data were obtained from death certificates of the National Civil Registry. All the available people free of functional limitation in 2000 was evaluated in 2005 to determine the risk (logistic regression) of having mobility limitations according baseline dynamometry, BMI, waist circumference and other chronic conditions. Survival estimates according BMI were also calculated.

**Results:** The 5y survival probability was 0,526 for the people with BMI 18.5-24.9 and 0.956 for the individuals with BMI ≥30. Kaplan Mier survival estimates according dynamometry adjusted by BMI, demonstrates higher survival rates for the people over the p25 of dynamometry (men= 27 Kg, women =15 Kg). The logistic model demonstrates that among anthropometric variables, only hand grip strength was associated (negatively) with 5-y risk of having ≥2 mobility limitations in both men (b= -221, p=0.002) and women (b= -230, p<0.001).

**Conclusion:** The results confirm the negative association of BMI and mortality. Moreover, none overweight nor obesity were associated with 5 y risk of having ≥ 2 mobility limitations.

## T5:PS.192

**Relationship between Parental Lifestyle and Childhood Obesity**

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**Background:** Children of obese parents are more likely to be obese. Parental lifestyle has an effect on their children's lifestyle through their socialization. Therefore, obesogenic lifestyle of the parents could induce or aggravate their children's obesity. The purpose of this study was to find the effect of parental lifestyle on childhood obesity.

**Methods:** Children enrolled in this study were first grade students from elementary schools in Gwacheon and Seoul city. A total of 121 children (50 overweight children and 71 normal weight children) and their parents were measured for their height and weight; and they also were surveyed by questionnaires.

**Results:** More children of obese parents were diagnosed as overweight compared to children whose parents' body weights were normal regardless of maternal or paternal lifestyles (Father: P=0.037, Mother: P=0.001). Among the paternal components, time for watching TV or computer usage (adjusted OR : 2.08, 95% CI : 0.90-4.80) and eating frequency of soda, ice cream, cake and chips (adjusted OR : 5.77, 95% CI : 1.65-20.22) were found to be related to their children's overweight. Among the maternal components, time for watching TV or computer usage (adjusted OR : 2.35, 95% CI : 0.99-5.58), frequency of eating breakfast (adjusted OR : 0.40, 95% CI : 0.17-0.94) and the frequency of overeating (adjusted OR : 2.15, 95% CI : 0.91-5.11) were found to be related to their children's overweight.

**Conclusions:** Parental obesogenic lifestyle was related to their children's overweight. Improvement of parental lifestyle is absolutely necessary for the effective management of childhood obesity.

**Key words:** Childhood obesity, Parents, Lifestyle, Eating habits, Physical activity.

## T5:PS.194

**Assessment of relation between physical activity and overweight and obesity in 20-50 years old women who are living in the north of Tehran, Iran, 2007: A pilot study.**

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**Introduction:** Less physical activity seems to be a major risk factor of obesity. So the aim of this pilot study is determination of relation between physical activity and overweight and obesity in 20-50 years old women living in the north of Tehran, Iran, 2007.

**Methods:** In this cross-sectional study, women living in the north of Tehran, was selected with clustered systematic method and with recourse to their home. Anthropometric data of weight (precision of 100g), height and waist (precision of 0.1cm) were measured with standard methods and body mass index (BMI) was calculated. Physical activity level (P.A.L) was obtained with a standard questionnaire via interviewing. This questionnaire was designed with the basis of P.A.L. In this questionnaire, at first amount of each P.A.L was calculated with basis of metabolic equivalent (MET). Then the time which was spent for each activity in a day was multiplied in MET of each activity. Sum of these amounts showed the total P.A.L (MET-h/day). MET $\geq$  29 was considered as active people. Data was analyzed by SPSS, version13 software.

**Results:** 38% of subjects were overweight (25 $\leq$ BMI<30), 15.5% obese (BMI $\geq$ 30), 38% had central obesity (waist>88cm).After adjustment for age, Active women had 45% less odds for overweight and obesity(OR=0.55;95%CI:0.15-2.00) and 34% less odds for central obesity(0.66;0.19-2.29) than other women.

**Conclusion:** Findings suggest that higher physical activity is in relation with less risk for overweight and obesity in these women.

**Key words:** physical activity, overweight, obesity, women, North of Tehran, Iran

## T5:PS.193

**School food vending machines and cardiovascular risk factors in 13-years-old Portuguese adolescents**

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**Objective:** To assess the impact of school food vending machines in cardiovascular risk factors and in food intake of 13-years-old Portuguese adolescents.

**Methods:** Twenty-six (96%) public and 17 (74%) private schools allow to in-site evaluation of foods available for selling at school. We evaluated 2002 adolescents (participation 78%). Food intake was evaluated using a semi-quantitative food frequency questionnaire. As cardiovascular risk factors we measured body mass index, blood pressure, glucose, insulin, the homeostasis model method (HOMA-IR), triglycerides, total and high-density lipoprotein cholesterol.

**Results:** A total of 49 machines were present in 22 schools. Machines that only sold beverages (carbonated beverages in three fourths) were present in 11 schools, and 6 schools had machines that exclusively sold chocolates. School cafeterias also sold unhealthy foods, as chocolate bars (33 cafeterias-82.5%), cakes and doughnuts (36 cafeterias-90.0%), candies, gums and popcorn (13 cafeterias-32.5%), and snack mix (6 cafeterias-15.0%). In public schools with food vending machines adolescents reported a significantly higher median (inter quartile range) daily intake of chocolate bars (7.1g (3.3-7.1) vs. 3.3g (0-7.1), p=0.018). After adjustment, students enrolled in public schools with vending machines presented significantly lower risk of overweight (OR:0.60, CI95%:0.42-0.86), and of a blood pressure above the 95<sup>th</sup> percentile (OR:0.75, CI95%:0.58-0.98) and lower fasting blood glucose, insulin and HOMA-IR.

**Conclusions:** Portuguese school environment not encouraging healthy food choices, with a strong availability of unhealthy foods. Higher intakes of chocolate bars were founded in schools with vending machines but its presence is not associated with an unfavorable cardiovascular risk profile.

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## T5:PS.195

**Association of snp G-2548 $\alpha$ A in the promoter of the leptin gene with Diabetes Mellitus in a Mexican population.**

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**Objective:** Obesity is a major risk factor for diabetes. In Mexico 70% of the population is obese and diabetes is the first cause of death. Leptin, an adipocyte secreted protein, plays a major role in food intake and energy balance regulation. Mammes discovered a G $\alpha$ A polymorphism at locus -2549 in the promoter of the leptin gene, which is related to obesity in western population. We investigated the possible association between this polymorphism and DM2.

**Methods and Results:** One hundred eighty four patients and 204 controls were examined for the presence of polymorphism

G-2548 $\alpha$ A using PCR-RFLP. Assay clinic and laboratory characteristics were measured. We found statistical differences in tobacco index, glucose, HDL and triglycerides. The polymorphism was in Hardy-Weinberg equilibrium. The frequency of the G allele was significantly different in patients compared with controls. We found association of the G allele in the diabetic patients group (OR 1.77, IC 95% and p<0.05).When we analyzed the frequency of allele G between males and females, we found that the allele G in male has association with DM2 (OR 2.4, IC 95% and p= 0.006).

**Conclusions:** This study suggests that the polymorphism G-2548 $\alpha$ A in the promoter of leptin gene could be used as a genetic marker of predisposition of DM2 in Mexico. Is the first time that this is described.

## T5:PS.196

## Overweight and obesity in serbian children

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Having in mind increasing prevalence of childhood obesity and its role in the development of adult obesity and chronic diseases, the aim of this study was to analyze prevalence of overweight and obesity among Serbian children.

In a cross-sectional sample of 3060 children (1637 boys and 1423 girls) aged 4-15 years, we analyzed BMI values and body fat percent (BF%). Nutrition level was assessed using CDC criteria for BMI values, and BF% was estimated according to equation given by Slaughter et al. (1988). Our results revealed overweight and obesity in 22.12% of children (23.95% of boys and 20.03% of girls). 9.90% of boys and 6.18% of girls had BMI above 95<sup>th</sup> percentile. Highest prevalence of overweight obesity was found in 7-9-year-old boys and 8-9-year-old girls. Boys had significantly lower BMI comparing to girls (17.53±3.10 vs. 17.20±2.98 kg/m<sup>2</sup>, respectively), while girls had significantly higher BF% (17.54±5.25 vs. 16.05±7.73 %, respectively). Using criteria for BF% values given by Ellis et al (1996) 12.09% of boys and 9.42% of girls had BF% above 25%, while 6.96% of boys and 2.67% of girls had BF% above 30%.

The findings of this study may be helpful in identifying children at risk for adolescent obesity and obesity-related disorders, as well as in providing an opportunity for earlier intervention.

## T5:PS.198

## Formulation and production of fortified Barbari bread with different Ca sources

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**Background:** Adequate calcium (Ca) intake during the crucial growing years maximizes peak bone mass and thus delays the onset of osteoporosis later in life. In addition, Ca plays a protective role against blood hypertension and colorectal cancer. Dairy products, a naturally rich Ca source, are the major source of Ca in our diet. However many people avoid consuming milk, because of economical problems and who are lactose intolerant. For these people, Ca-fortified nondairy foods can be a significant source of Ca. A number of foods, including bread, staple food, can be fortified with Ca. In this study, formulation and production of fortified Barbari bread with different Ca sources was investigated in 2007.

**Materials and Methods:** In order to, different kind of Barbari breads were prepared with flour fortified with Ca sources such as Ca carbonate, Ca sulfate, whey powder and Ca carbonate plus lactose. Ca was added to flour at two levels: 500 and 1000 mg/ 100 g of flour. One bread was also prepared using ordinary flour. Rheological tests were done by Farinograph and Extensograph, bread staling by organoleptic and Viscoelastograph and a amount of Ca was measured by Atomic Absorption.

**Results:** Results of Farinograph and Extensograph tests indicated strength of dough. Results of Farinograph test indicated that the percent of water absorption, dough development time, dough stability and valorimeter value will increase by adding Ca, while the degree of dough softening in 10 and 20 minutes, will reduce. Also atomic absorption spectrophotometry test showed that retaining of Ca in breads was significant (P<0.05).

**Conclusion:** According to sensory evaluation and Viscoelastograph, CaCO<sub>3</sub>, CaSO<sub>4</sub> and whey powder are preferred sources of Ca for the fortification of cereal-based foods as they had no adverse affect on bread quality. CaCO<sub>3</sub> is higher in Ca than CaSO<sub>4</sub>. It is also less expensive. For these reasons, Ca carbonate is a preferred Ca source for fortifying bread.

**Key words:** Fortification, Barbari bread, Calcium carbonate, Calcium sulfate, Whey powder

## T5:PS.197

## Anthropometric indicators of abdominal obesity and cardiovascular risk factors

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Abdominal obesity increases the risk for development of cardiovascular disease and diabetes type 2. Several anthropometric measures have been proposed as a good predictors of cardiovascular risk and it is still under discussion which measure best reflects the level of cardiovascular risk. The aim of our study was to examine correlations between anthropometric indicators of abdominal obesity and metabolic risk factors in regard to the nutritional level, as well as in regard to age.

Study group consisted of 881 subjects (291 males and 590 females). Nutritional level was assessed using BMI, while adiposity (BF%) was assessed using bioelectrical impedance method. We analyzed following abdominal anthropometric indicators: waist circumference (WC), waist to height ratio (WHTR), sagittal abdominal diameter (SAD) and SAD to height ratio (SADH). Blood pressure, cholesterol, triglycerides, HDL- and LDL-cholesterol, fasting glucose, index of atherosclerosis, fibrinogen and uric acid were measured.

SAD and SADH were better predictors of risk in normal weight males, while WC and WHTR were better predictors in normal weight females. In overweight and obese subjects WC and WHTR correlated stronger with risk factors, comparing to SAD and SADH. Reliability of all anthropometric indicators in risk prediction decreased with aging in males, while in females relationship between anthropometric indicators and risk factors was stronger in subjects younger than 30y and in subjects older than 50y. SAD was the best predictor of BF% in normal weight males and in overweight males. Best predictors of BF% in normal weight and overweight females were WC and WHTR, respectively.

## T5:PS.199

## Comparison of the relationship between body mass index and relative total and central adiposity in North Africans, West Africans and Caucasians

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Body mass index (BMI) has been used to define overweight/obesity and characterize their associated risks. However, interest in classifying subject health status according to adiposity is increasing. Percentage body fat (%BF) should be a better indicator of excess body fat, whereas waist circumference (WC) a better predictor of disease, than BMI. Beyond known differences in body composition between Caucasians (CA) and Asians, little is known about Africans. We contrasted the relationships between %BF and BMI or WC in North-Africans (NA), West-Africans (WA) and CA. %BF, estimated by bioelectrical impedance, was modelled as a function of BMI and BMI<sup>2</sup> or WC and WC<sup>2</sup>.

	Men (M)		Women (W)	
	NA (n=135)	WA (n=469)	NA (n=92)	WA (n=1576)
BMI (kg/m <sup>2</sup> )	%BF predicted from BMI or WC values			
18.5	8.6	11.1	23.2	26.6
25.0	18.5	21.7	33.3	37.5
30.0	25.7	29.8	40.5	44.9
WC (cm)M/W				
90/80	17.9	24.4	32.9	38.9
95/85	20.2	28.0	35.4	42.1
100/90	22.5	31.9	37.9	45.1
105/95	24.8	35.8	40.6	48.0

The derived %BF values from standard BMI cut-off points or WC values were higher among WA than NA (P<0.0001), and the difference increased with WC values. Moreover, when compared with a group of 141 CA men, NA men showed similar %BF values derived from IMC<30 and WC>100 cm (data not shown). These results suggest ethnic variations in the relative total adiposity as well as the distribution of body fat. Particularly, universal BMI or WC cut-off points, established in CA, are likely not appropriate for comparison of obesity prevalence or risk assessments in WA.

## T5:PS.200

**The usefulness of percent body fat as a diagnostic tool for childhood obesity**Kang JH<sup>1</sup>, Park SY<sup>1</sup>, Seo GY<sup>1</sup>, Yu BY<sup>1</sup>, Lee SY<sup>2</sup>, Sung E<sup>3</sup><sup>1</sup>Dept. Of Family Medicine, Konyang University Hospital; <sup>2</sup>Dept. of Family Medicine, Inje University Sanggye Paik Hospital; <sup>3</sup>Dept. of Family Medicine, Kangbuk Samsung Hospital**Background:** Obesity is defined as an excess accumulation of body fat, but there are few studies about the usefulness of percent body fat for diagnosis of childhood obesity.**Methods:** Anthropometrics, blood pressure, blood sample, and body composition analysis using bioelectrical impedance analysis were obtained from 1,021 Korean obese elementary and middle school students. The correlations between the obesity indices such as body mass index (BMI), percentage-weight-for-height (PWH), and percent body fat (PBF) and metabolic risk factors were measured after controlling age and sex.**Results:** PBF was significantly correlated with systolic blood pressure, diastolic blood pressure, triglycerides, insulin, and HOMA-IR. However, the correlation coefficients between PBF and metabolic risk factors were higher comparing with those between metabolic risk factors and BMI or PWH. Odds ratios for high systolic pressure, high triglycerides, low HDL-cholesterol and insulin resistance in obese children diagnosed by over 35% of PBF were the lowest compared with odds ratios in obese children diagnosed by above the 95th percentile of BMI and over 120% of PWH.**Conclusions:** The percent body fat as a diagnostic tool for predicting metabolic abnormalities in Korean obese children was not superior to BMI or PWH.

## T5:PS.202

**The Validity of Self Reported Body Mass Index**Kim K<sup>1</sup>, Oh HJ<sup>2</sup>, Yoo SH<sup>3</sup>, Park MS<sup>2</sup>, Kim YS<sup>4</sup><sup>1</sup>Department of Family Medicine, Inha University Hospital, Korea  
<sup>2</sup>Department of Family Medicine, Seoul National University Hospital  
<sup>3</sup>Department of Family Medicine, Hallim University Hospital  
<sup>4</sup>Department of Internal Medicine, Inha University Hospital**Background:** Body Mass Index (BMI) is the indicator most widely used to measure obesity. There would be errors if obesity is determined not by measured BMI, but by self reported BMI. Therefore, this study assessed the accuracy and validity of self reported BMI and identified factors that influence on the misclassification of obesity.**Methods:** We included 16,153 participants (8,399 men and 7,754 women) who visited a HPC in Seoul and weight, height and general characteristics were obtained by self administrated questionnaire. Pearson product moment correlation coefficients,  $\chi^2$  analysis, sensitivity, specificity were used to determine the accuracy and validity of self reported BMI. We used the logistic regression analysis to identify variables associated with the misclassification of obesity.**Results:** Weight and height were overestimated for both men and women, and these biases led to underestimations of BMI. Despite the strong correlations between measured and self reported BMI, the prevalence of obesity calculated from measured values was higher than that calculated from self-reported values. Sensitivity and specificity for the self reported BMI were 82.6% and 96.8%, respectively. Female, increasing ages, lower income, and lower education were higher risk factors for the misclassification of obesity.**Conclusion:** There would be underestimation of obesity in case of using self reported BMI for obesity. Therefore, height and weight of first-time visitors should be measured in-hospital to screen obesity, which will help to diagnose obesity precisely and allow the effective treatment of obesity-related diseases.

## T5:PS.201

**Comparative study of dietary preferences between rural and urban populations in Greece. Relations of maternal and childhood BMI at low socioeconomic status.**C Karakos<sup>1</sup>, K Stamatou<sup>1</sup>, G Ilias<sup>1</sup>, C Chloptsios<sup>1</sup>, M Christakis<sup>1</sup>, D Damianaki-Ouranou<sup>2</sup><sup>1</sup> General Hospital of Thebes, Thebes, Greece; <sup>2</sup> Tzaneion General Hospital, Pireus, Greece**Objective:** The goal of this study was to evaluate the relationship between residence and dietary preferences with maternal and childhood BMI at low socioeconomic status.**Research Methods and Procedures:** The material of our study was a group of 5- to 18-year-old children and their mothers, all from the rural Biotia Region and the urban Piraeus, low socioeconomic status. Data from these 42 mother-child pairs residing in the same household was used. A questionnaire examining the quantity and quality of the dietary habits, as well as the adherence to the traditional Mediterranean dietary model has been distributed in mothers of both groups. A regression analysis of dietary maternal factors associated with childhood obesity or the risk-for-overweight has been performed using the SPSS programme.**Results:** Accordingly to our findings, more than half of the boys and girls of urban area (54% and 60%, respectively) were either overweight or at-risk-for-overweight. Obese mothers were twice as likely to have an overweight and/or at-risk-for-overweight child compared with normal-weight mothers. Women born in urban areas were twice as likely to have an overweight and/or at-risk-for-overweight child compared with women born in rural areas. On the contrary, maternal obesity in rural areas is not linked with either child overweight or risk-for-overweight.**Discussion:** The high prevalence of overweight or at-risk-for-overweight among children of low socioeconomic status in urban area suggests a continued need to develop and practice certain informative programs targeted to low socioeconomic populations. Health professionals who get in touch with such populations should inform accurate the overweight persons and perform dietary and BMI controls repeatedly.

## T5:PS.203

**Finding correlation of body mass index (BMI) and lower urinary tract symptom due to benign prostatic hypertrophy(BPH) in Korean**Kim SH<sup>1</sup><sup>1</sup> Myongji hospital, University of Kwandong, Goyang, Korea**Background:** There was a study about the increasing prevalence rate of the benign prostatic hypertrophy(BPH) was likely due in part to an increasing the level of body mass index(BMI). In fact, a lot of aged male group suffer symptoms of BPH. And among the causes, obesity seems to be correctable cause – therefore, we decided to investigate what is the correlation of obesity and BPH symptoms**Methods:** As the objects of this study, we surveyed 119 men over the age of 40 who were diagnosed as BPH, and got an operation of it in a general hospital Goyang city in Korea from March 2004 to February 2007. We analyzed the relationship of International Prostate Symptom Score (IPSS) and each BMI groups and analyzed the IPSS based upon smoking, drinking alcohol, coffee, exercise, diabetes, and essential hypertension.**Results:** There were differences in the 3 groups according to the BMI groups of the IPSS. And as the BMI increases, the IPSS were increased. There were no differences in the IPSS by the other factors such as smoking and drinking.**Conclusion:** As the BMI increases, the IPSS points increased. BPH patients with high BMI should lose weight to relieve lower urinary tract symptom.

## T5:PS.204

**Diet-induced thermogenesis in Japanese assessed in a respiratory chamber: how to improve the accuracy of estimation**Kumahara, H<sup>1</sup>, Tanaka, H<sup>1</sup>, Schutz, Y<sup>2</sup><sup>1</sup>Fukuoka University, Fukuoka, Japan; <sup>2</sup>University of Lausanne, Lausanne, Switzerland

**Objective:** Today, the diet-induced thermogenesis (DIT) component still provides meaningful information on obesity research. However, assessment method of DIT is difficult if the total thermogenic response is required. We wanted to develop an alternative technique of computing DIT using data obtained from respiration chamber measurements. Such information in the Japanese population has been lacking.

**Methods:** 49 females and 27 males Japanese subjects stayed in the chamber for 24h. The DIT due to total feeding over the day (for 15h) was evaluated using a traditional principle that calculates the difference between the energy expenditure (EE) without physical activity (PA) (from the intercept of regression equation of EE and PA index) and basal metabolic rate. We proposed 3 indices for evaluating PA, i.e. time duration, intensity and volume (duration\*intensity) of PA assessed using a traditional Doppler radar technique and a validated accelerometer, respectively.

**Results:** The DIT, expressed as a percentage of the total energy ingested, averaged 8.1+/-4.7% when the time duration was used for the calculation, and 5.9+/-4.8% when the PA intensity was used. The DIT of 11.4+/-3.8% was found when the volume of PA was accounted for. This combined index had the advantages in terms of goodness of fit of the regression equation with EE (p<0.05), and in provided a relatively reasonable results, as compared to the other two indices.

**Conclusion:** Our improved method based on the traditional principle could partly help to overcome the shortcomings of the previous technique. This technique also brings more consistent results with the literature of computing DIT at a group level.

## T5:PS.206

**Sensory acceptability of strawberry and chocolate cornflakes by normal and overweight elderly people**Perl Pirički, A<sup>1</sup>, Adam Perl, M<sup>2</sup>, Banjari, I<sup>1</sup>, Ivanković, S<sup>1</sup>, Naimarević, V<sup>3</sup><sup>1</sup> Faculty of Food Technology, Osijek, Croatia; <sup>2</sup> Clinical Hospital Osijek, Osijek, Croatia; <sup>3</sup> Elderly Nursing Home, Nuštar, Croatia

Food choice is influenced by many interrelated factors, among others aging and obesity status. People's food preferences vary during aging. In particular, elderly people show a decrease in pleasantness associated with food intake as a result of both physiological and psychological factors. They are very specific in their flavour and textural requirements and therefore more demanding. It has also been theorized that overweight is related to unhealthy (i.e. energy-dense food) food preferences. Therefore the aim of this work was to examine sensory acceptability of breakfast cereals in different weight categories of elderly people and to determine whether crispy and mashed texture had influence on these preferences. A 7-point verbal hedonic scale was used to determine the level of acceptance for all samples. Research involved 218 (146 females and 72 males) institutionalized elderly people, age 55 to 93 (mean age 75.7). The mean hedonic score for all participants was 4.92 and 4.84 for mashed, and 4.05 and 3.73 for crispy strawberry and chocolate cornflakes, respectively. Pearson's correlation showed that obesity status had influence on choice; overweight and obese participants had better preference towards all provided cornflakes. Furthermore, we affirmed the hypothesis that food texture has influence on elderly people preferences. They significantly prefer mashed texture (p<0.001 for both strawberry and chocolate cornflakes). In conclusion, this research emphasised the thesis that overweight and obese elderly people have an enhanced liking for cornflakes regardless of taste and texture.

**Key words:** cornflakes, overweight status, sensory acceptability, elderly people

## T5:PS.205

**Behavioral-cognitive obesity treatment**Lančić, F<sup>1</sup>, Jureša, V<sup>2</sup>, Jurisa, A<sup>2</sup><sup>1</sup>Public Health Institute Varazdinska County, Croatia; <sup>2</sup>Andrija Štampar School of Public Health Medical School University of Zagreb, Croatia

**Context:** According to behavioral theory obesity is a result of overeating as a learning process.

**Goal:** The goal of the treatment was: awareness of eating habits, controlling the eating habits, adopting healthy eating habits and everyday physical activity, reducing body weight for 5% in 6 months, reducing waist line

**Methods:** Body weight and height, Body mass index, blood pressure, waist and hip line were measured before the treatment. Also laboratory tests and behavior-cognitive interviews were conducted. The treatment consisted 15 sessions, 8 sessions once a week, 4 twice a month and 3 once a month. Different techniques were used: Behavioral (self observing, behavior testing, operative conditioning, distractions, and coping cards), cognitive (cognitive restructuring, problem solving, positive self statements), relaxation (abdominal breathing, imagination).

**Results:** Healthy eating knowledge was improved and waist line was reduced from 112 cm to 108 cm. Healthy eating attitudes and everyday physical activity was partially accomplished. Reducing the body weight was not accomplished at the end but in the middle of treatment body weight was dropped.

## T5:PS.207

**Dietary patterns and their relation with overweight and obesity of 20-50 years old women who are living in north of Tehran city, Iran, 2007: A pilot study**Rezazadeh Sarabi A<sup>1</sup>, Rashidkhani B<sup>1</sup>, Omidvar N<sup>1</sup>, Hoshyar rad A<sup>1</sup><sup>1</sup>National Nutrition and Food Technology Research Institute, Shahid beheshti university of medical sciences and health services, Tehran, Iran

**Introduction:** Few studies were studied the relation between dietary pattern and obesity. The aim of this pilot study is determination of Dietary patterns of 20-50 years old women who are living in north of Tehran city, 2007 and their relation with overweight and obesity.

**Material and Methods:** In this cross-sectional pilot study 55 women (20-50 years old) living in north of Tehran, were sampled with clustered systematic method. Dietary intake were assessed with a standard semi-quantitative f.f.q. Anthropometric factors were measured with standard methods. Factor analysis method was used for identifying of major dietary patterns.

**Results:** 3 major dietary pattern were identified: healthy dietary pattern (fruit, green, red and yellow vegetables, cabbages, olive, legumes, fish and poultry), western pattern (processed meat, red meat, Liver and organ meats, snacks, pizza, high fat dairy products, butter, mayonnaise, egg, sweets, sugars, juice, soft drinks) and traditional pattern (garlic, liquid and hydrogenated fat, nuts, potato, pickles). Dietary patterns scores were divided in 2 groups on the basis of mean. After adjustment for age and husband's income, women in the upper group of western pattern had no odds (OR=0.98, CI:95% ; 0.191-5.018), healthy pattern 20% less odds (0.80; 0.17 -3.76) and traditional pattern 32% higher odds (1.32; 0.29-5.99) for overweight and obesity (BMI≥25) and upper groups of healthy pattern had 10% less odds (0.90; 0.22- 3.68), western pattern 15% ( 1.15: 0.26-5.06) and traditional pattern 9% (5.09:0.27-5.13) higher odds for central obesity (waist> 88cm).

**Conclusion:** Findings suggest healthy pattern is in relation with less risk of overweight and obesity especially central obesity than western and traditional patterns in these subjects.

**Keywords:** Dietary patterns, overweight, obesity, women, north of Tehran, factor analysis

## T5:PS.208

**Anthropometric Indicators in below 5 year old children with obese mothers**Salarkia N<sup>1</sup>, Esfarjani F<sup>1</sup> & Golestan B<sup>2</sup><sup>1</sup>National Nutrition and Food Technology Research Institute, Shaheed Beheshti Medical University, Tehran, Iran; <sup>2</sup>Tehran Medical University, Tehran, Iran

**Background:** Many previous studies have shown that children with obese parents could have different anthropometric characteristics, leading to the development of obesity in comparison with those with non-obese parents. The aim of this study was to compare characteristic physical growth in children with obese and those with non-obese mothers.

**Methods:** In a descriptive study, 137 children aged below 5 years and 126 mothers of them in low income families were studied. The heights and weights were measured by standard methods. Anthropometric indicators such as weight for age, height for age and weight for height were compared with NCHS as reference. Mothers with body mass index above 25 kg/m<sup>2</sup> were defined as obese mothers.

**Results:** Low weight for height had an overall prevalence of 6.3% that was higher in children with obese mother than in those with non-obese mother (5.1%). It is estimated that prevalence higher than 5% is indicative of an increasing some major nutritional deficiencies in the population. The prevalence of low weight for age (7.3%) and small height for age (8.3%) and big weight for age (4.7%) in children with obese mothers were lower than in those with non-obese mothers.

**Conclusion:** Based on the results the most affected anthropometric indicator was the weight for height that shows a mild malnutrition in subjects. Characteristic indicators observed in children with obese mothers showed a strong relationship between child and mother body compositions. Educational programs to promote mothers nutritional knowledge will be required to prevent further nutritional problems in children.

## T5:PS.210

**Small-group weight management programme using self selected goals improves General Well Being scores.**Simper, T<sup>1</sup>, Paxman<sup>1</sup>, J. O'Keeffe, J<sup>2</sup><sup>1</sup>Sheffield Hallam University, Sheffield, United Kingdom <sup>2</sup>Versa charity organization Keighley West Yorkshire

**Introduction:** Obesity is associated with poor mood and elevated indices of depression. The 'small changes' programme is a seven week 'course' which involves subjects selecting weekly 'challenges' that involve positive dietary change and increased energy expenditure. The challenges were chosen with 2 facilitators (nutritionist and counselor) who ensured these were realistic and measurable.

**Method:** 18 Subjects, 13 female and 5 male (BMI 36.4 ± 9.38 kg/m<sup>2</sup>, age 45.08 ± 11.02yrs) were separated into an experimental and control group for the small changes programme. Controls were given healthy eating information. The experimental group completed 7 weekly two-hour sessions focusing on selecting goals for weight management. The general well being scale (GWB, Dupuy 1978) was used to measure affective state. This was recorded at baseline and week 7. Participants' challenges all related to alteration in diet or physical activity. Suggestions were not made by the facilitators.

**Results:** using SPSS version 13 analysis showed the experimental group GWB scores had improved significantly (p=0.028) by the end of the programme from 64 to 77 (61-72 = moderate distress 73-110 = positive well being). In the control group GWB scores did not alter significantly (69.00- 72.50 P=0.615).

**Conclusion:** the immediate results of the small changes intervention where subjects self-select dietary and physical activity goals facilitated by a behavioural change expert and a nutritionist show a positive improvement in affective state. Continued development of the small changes programme and analysis of self-selected goals with a larger cohort is warranted. Follow up from this trial will go on for five years.

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## T5:PS.209

**Melanocortin 3 receptor gene variants: association with childhood obesity and insulin resistance in Chilean families**Santos JL<sup>1</sup>, Obregón AM<sup>1,2</sup>, Amador P<sup>2</sup>, Weisstaub G<sup>2</sup>, Burrows R<sup>2</sup>.<sup>1</sup> Department of Nutrition, Diabetes and Metabolism. Faculty of Medicine. Pontificia Universidad Católica de Chile. Santiago, Chile.<sup>2</sup> Institute of Nutrition and Food Technology (INTA). University of Chile. Santiago, Chile.

**Introduction:** Linkage and association studies in humans and results from animal models suggest a role for the melanocortin 3 receptor gene (MC3R) in obesity.

**Aim:** to assess the association between genetic polymorphisms of MC3R with childhood obesity and insulin resistance in Chilean families.

**Subjects and Methods:** We recruited 160 obese children (6-12 years-old; BMI above P<sub>95</sub> of NCHS/CDC 2000) from which we selected 180 parents in 90 case-parent trios. The genotypes of MC3R Thr6Lys, Val81Ile, -239A>G, +2138InsCAGACC and D20s32e were determined by PCR-RFLP and capillary electrophoresis techniques. In order to adjust insulin levels by age and pubertal status in children, a z-score for Homeostasis Model Assessment (HOMA) was calculated using Chilean reference data (Burrows et al. Rev Med Chile 2006; 134: 1417-1426). The Transmission Disequilibrium Test (TDT) was calculated to assess genotype-obesity associations while non-parametric tests were used to compare HOMA measurements across study groups defined by MC3R genotypes in children.

**Results:** Frequencies of -239G, 17A, 241A and +2138InsCAGACC alleles were estimated as 5.3%, 4.8%, 4.1% and 16.1% respectively. TDT in case-parent trios revealed no significant genotype-obesity associations for any of the genetic variants including the D20s32e marker. Likewise, no significant differences were found when comparing z-scores of HOMA across MC3R genotypes in children, although a non-statistical trend is observed for higher HOMA values in carriers of -239G and +2138InsCAGACC alleles versus non carriers.

**Conclusion:** There are no sufficient evidences to support a role for MC3R variants in childhood obesity or insulin resistance in Chilean families. Supported by FONDECYT 1061096.

## T5:PS.211

**Environmental determinants of obesity in adolescents**D-T Anton<sup>1</sup>, C Oltean<sup>1</sup>, M Burlacu<sup>1</sup>, L Bozomitu<sup>1</sup>, D Moraru<sup>1</sup><sup>1</sup>III-rd Clinic of Pediatrics-University of Medicine and Pharmacy Iași, Romania

**Background:** The increasing prevalence of obesity in adolescents suggests that environmental factors are promoting or exacerbating the problem.

**Objectives:** To identify and modify environmental factors that promote obesity and to establish the role of the parents in the prevention of children's weight problems.

**Methods:** The lot studied was formed by 64 adolescents diagnosed with obesity in the III-rd Clinic of Pediatrics Iași-Romania between 1992-2007. We followed the risk factors for obesity.

**Results:** Next factors were present to our patients: increased birth weight-15 cases, consume of the artificial milk rather than breastfeeding in infancy-48 cases, low mother's education level-35 cases, supersized meals-50 cases, high fat diets-40 cases, consume of a variety of energy-dense foods-50 cases, unlimited access to foods-50 cases, sedentary behaviour-50 cases, parental fatness-16 cases. Our effective interventions included: comprehensive behavioral management, dietary modification and physical activity. Some of 64 adolescents studied succeeded in modifying their habits: decreasing concentrated foods-38 cases, decreasing the consumption of sweetened drinks-28 cases or of fast-food products-25 cases, improved of physical activity-30 cases. We have succeeded in parental involvement only in 35 cases.

**Conclusions:** The family involvement remains an essential component as part of obesity management. It is urgent to propose interventions taking account all environmental factors which could cause obesity.

## T5:PS.212

**Linkage between a multidisciplinary evaluation of obesity and the International Classification of Health, Disability and Functioning Disease (ICF).**

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The first outcome of obesity treatment is weight loss followed by the reduction in the severe disability related not only to clinical problems but also to the psychological, familiar and social impairment that reduce the quality and participation at everyday life in obese. To evaluate the disability we can use a new instrument: the International Classification of Functioning, Disability and Health (ICF) developed by World Health Organization that classifies body functions (b) and structures (s), activity and participation (d) and contextual factors (e). It may generate a functioning profile particularly in some chronic diseases.

We linked the information obtained by a multidisciplinary approach to obesity with the ICF categories. Medical evaluation, with laboratory and instrumental tests, covered the domains of body function (from b1 to b8) and structures (from s1 to s8), but also, with an interview, environmental factors (e1, e2, e5). Psychological testing and interviews analyzed mental functions (b1), relationships (d7, d8, d9) and environmental factors (e3, e4, e5). Dieticians reconstructed nutritional behaviour (b5, d5, d6). Nurses, physiotherapists and movement therapists by different scales controlled the self care (d5), domestic life (d6) besides mobility (d4).

This approach seems suitable to define the disability related to obesity and might recognize the different risks factors for maintenance of this condition. The impact of these information on rehabilitation program might obtain a better care profile. Furthermore, the identification and possible correction of risk conditions might drive also successfully public health programs.

## T5:PS.214

**BIA - method for assessment of body composition.**

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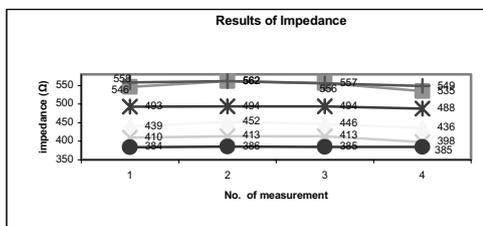
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**Background:** BIA represents one of the methods for classification of body composition. As obesity refers not to excessive body weight but to the condition in which the individual has an excessive amount of body fat. Many laboratory and field assessment techniques exist for estimating a person's body composition.

**Goals:** This work deals with a question of measuring human body compositions. The task is to find out what the role of body hydration is. The goal is to find out what effect liquid consumption has to the measurement.

**Methods:** 6 young individuals from the university in the age group of 21 to 23 years were included in the monitoring. Average BMI was 19.8 to 24.9. All individuals were people having average values of biological parameters. The device Tanita TBF 410 was used. All individuals filled in the medical history form. All drank 1.5 liter of water. Measurements were taken before drinking, 1 hour after drinking, then 30 minutes later and the last measurement was taken before going to toilet.

**Results:**



In the graph there is shown increase and decrease of impedance during the measurements for all six subjects.

**Conclusion:** In this work the importance of hydration for the measurement has been proved. According to the results acquired during the measurement impedance changes as water is distributed in the body. Therefore the importance of hydration can be crucial for good results of measurements and it is necessary to know in which state the measurement is performed, i.e. before water consumption or after and at what time. Otherwise the results of such a measurement can be very biased. The results also depend on the initial conditions, i.e. whether the person was already hydrated or dehydrated. This is additional information necessary for correct evaluation.

## T5:PS.213

**A qualitative assessment of student's snack and buffet status in middle school's of Tehran, 2006.**

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**Introduction:** As the school buffets are one of the main sources to provide snacks and with respect to high consumption of junk food in their snacks, this study carried out to discover students' standpoint and performance of about consumption breakfast, and snack' and evaluating school buffets' status in Tehran by Group Discussion.

**Methods:** This was qualitative research which sampling was done based on research objectives and 240 students from 12 guidance schools in district 4 of Tehran were selected. The field work activities consisted of 24 FGD (Focus Group Discussion) sessions; each of them was held with 8-10 students and lasted about 60 minutes. All notes were compared, controlled by recorded file and probable defects removed. Then data were classified and analyzed.

**Results:** The results showed that the reason of snack consumption in more than half of students were feeling weak and hunger. Cake, waffle and milk in more than half of girls and fruit, sandwich and cake in some boys were consumed. Most of students believed that buffets' existence is necessary and majority of them stated that the status of their school buffets was medium to bad. More than half of students thought that food items of buffets were expensive, unhealthy, nonnutritive and without diversity.

**Conclusion:** With respect to undesirable snack pattern of students, improving buffet's status which increases availability to valuable snacks is an important step to change food behaviors of students.

**Key Words:** adolescence, snack, buffet, FGD

Please note that EASO encourages full disclosure of all relevant sources of funding in relation to abstracts submitted to this congress. If you wish to disclose a conflict of interest or any funding, please do so briefly at the foot of this abstract as follows: National Nutrition & Food Technology Research Institute, NNFTRI.

**Funding:** National Nutrition & Food Technology Research Institute, NNFTRI.

## T5:PS.215

**Connection of Body Mass Index and Sedentary Behavior, Eating and Drinking Habits**

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**Objective:** To examine association between children's Body mass index and television viewing, computer and internet use, eating and drinking habits.

**Design:** Anonymous questionnaire about computer and internet use, television watching, eating and drinking habits, parent's education, children's height and weight.

**Subjects:** Accidental sample of children from 8 typical elementary schools from city of Zagreb, 5th and two 8th grade.

**Methods:** Statistic analysis: descriptive methods, factor analysis, factor discriminant analysis. IOTF Criteria for overweight and obese.

**Results:** Normal weight children are described with: higher parental education, more eating and drinking while online, less using computer and internet, less TV watching, less cause for TV watching and computer use. Overweight and obese children are described with: lower parental education, less eating and drinking while online, more using computer and internet, more TV watching, more cause for TV watching and computer use.

**Conclusion:** We could assume that although normal weight children eat and drink more while using internet they spent less time in front of computer and TV.

## T5:PS.217

**Tackling the social and economic determinants of nutrition and physical activity for the prevention of obesity across Europe: EURO-PREVOB**Knai, C<sup>1</sup>, Pomerleau, J<sup>1</sup>, McKee, M<sup>1</sup> and the EURO-PREVOB Consortium<sup>1</sup> London School of Hygiene & Tropical Medicine, London, United Kingdom

EURO-PREVOB is a new coordination action project linking science and policy-making to tackle obesity in Europe (www.europrevob.eu). The project is funded by the European Commission's 6th Framework Programme, is set to run until April 2010 and involves 14 participants from 11 European countries. EURO-PREVOB promotes and supports collaboration across existing networks to tackle the social and economic determinants of obesity in Europe.

The objectives of EURO-PREVOB are to improve the understanding of the broad determinants of and inequalities in obesity; identify policy initiatives that can impact positively on the determinants of obesity; develop and pilot tools to assess the potential impact of policies on determinants of obesity that are appropriate to different sub-regional contexts; and develop and disseminate guidelines and recommendations for best practice.

The project findings will inform public health strategies for obesity prevention, and contribute to best practice in obesity prevention and to the broad dissemination and streamlining of actions against obesity in Europe. Policy tools are being developed to assist obesity policy analysis, identifying the opportunities and limitations of policy transfer to and among European countries. EURO-PREVOB is assessing the applicability of the policy analysis tools in six sub-regions of Europe.

Further details of the project objectives, methods and preliminary results will be presented at the ECO 2008 meeting.

**Funding:** Research relating to this abstract was funded by the European Commission's 6<sup>th</sup> Framework Programme (Project no. 044291).

## T5:PS.219

**Prevalence of overweight and obesity in a middle-aged, sedentary life style and high educational level population.**Navarro Cruz A.R.<sup>1</sup>, Dávila Márquez R.M.<sup>1</sup>, Ávila-Sosa R.<sup>1</sup>, Vera López O.<sup>1</sup>, López Plaza B.<sup>2</sup>, García González L.<sup>2</sup><sup>1</sup> Benemérita Universidad Autónoma de Puebla, Facultad de Ciencias Químicas<sup>2</sup> Universidad Complutense de Madrid, Facultad de Farmacia

The purpose of this study was to determine the prevalence of overweight and obesity in a population of middle-aged, sedentary lifestyle and high educational level in the city of Puebla, Mexico. The epidemiological study was cross-sectional survey, the sample was conformed for 74 participants of both gender (37 men and 37 women). It was applied a registration sheet to each participant, also an anthropometric measurement was carried out: weight, size, circumference of waist and hip, cutaneous folds (bicipital, tricipital, subscapular and supraíliac).

The average age was of 44.95±7.76 years old; 25% of the population was classified overweight and 14% with obesity according to BMI, percentage of body fat in female was 34.5% and 25.3% in males, waist circumference was 87.37±9.35cm in women and 94.09±8.12cm in men.

**Conclusions.** Given the magnitude and prevalence of obesity, it is seen in Mexico as a threat to the Public Health because it has a negative impact on the quality of life of the population, due to their associated with various chronic diseases, such as diabetes mellitus type 2, cardiovascular disease and certain malignancies, among others. There is a need for continued research related to overweight, obesity and its associated factors, in order to raise and implement strategies for effective solution to monitor the occurrence of these events.

## T5:PS.218

**Health plus project -on line help for patients and their physicians in the treatment of obesity**Matějková, D<sup>1</sup>, Müllerová, D<sup>1</sup>, Svacina, S<sup>2</sup>, Matoulek, M<sup>2</sup>, Olsakova, E<sup>2</sup>, Slaba S<sup>2</sup>.

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**Aim:** To develop, implement and validate tool enabling health care professionals to influence life style risks factors of their patients with overweight and obesity with light and moderate grade of co-morbidities.

**Methods:** It is deal with creation of software, which part Nutrition plan builder (NPB) is intended to be used by patient on line. This system must be safety either from sight of personal data security, either from sight of recommendation. Health safety is given by delimitation of users to be concern due to incorporation of psychological questionnaire in the enter block of the system, prohibiting enter to unfit users. Software continuously evaluated changes of user state and it is furnished with alarming signals informing health care professionals about not appropriate behaviour of their patients. NPB creates on the interactive manner due to optimization of patient choice individual dietary plan. It is based on knowledge database of nutritional composition of food and nutritional decision criteria respecting individual nutrition state and development of body weight and on actual physical activity pattern of patient. Psychological part of the system tries to motivate patients' effort to continue in healthy life style.

Research relating to this abstract was funded by IST -2004-027126

## T5:PS.220

**Waist Circumference, Body Mass Index and Cardiovascular Risk Factors**

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**Background:** The purpose of this study was to evaluate relationships between waist circumference (WC), body mass index (BMI) and cardiovascular risk factors.

**Methods:** The subjects consisted of 626 adults who participated in a medical checkup. According to Asia-Pacific guidelines, subjects were grouped following; First, subjects were divided into two groups by WC (normal versus high), Second, subjects were divided into two groups by BMI (Group 1; 18.5 kg/m<sup>2</sup> ≤ BMI < 25.0 kg/m<sup>2</sup> versus Group 2; 25.0 kg/m<sup>2</sup> ≤ BMI < 30.0 kg/m<sup>2</sup>), Third, subjects were divided into high WC group and normal WC group within the same BMI group. As each reference, odds ratios for hypertension, diabetes, dyslipidemia, and the metabolic syndrome were compared.

**Results:** Within the BMI Group 1, individuals with high WC values had greater risk for hypertension, hypercholesterolemia, hypertriglyceridemia and metabolic syndrome compared with those with normal WC values. Within the BMI Group 2, individuals with high WC values had greater risk for hypertension and metabolic syndrome compared with those with normal WC values. These associations remained statistically significant after adjusting for age and sex.

**Conclusion:** Evaluation of each WC and BMI may be a useful method for the assessment of cardiovascular risk, and it is thought to be practical and important to evaluate WC in addition to the BMI.

**Keywords:** waist circumference, body mass index, cardiovascular risk factors.

## T5:PS.221

**Weight change of participants in the Weight Watchers GP referral scheme.**Poulter, J.<sup>1</sup> Hunt, P.<sup>1</sup><sup>1</sup> Nutrition Works!, Maidstone, UK.

Weight Watchers offers an effective self-referral system for overweight and obese people based on lifestyle change through behavioural techniques and group support (Heshka et al 2003). This model has recently been offered as a 12-week treatment package, with patients receiving vouchers for free classes, through primary care trusts or occupational health schemes in the UK.

We collected data on weight change from 1058 courses in 21 regions. Data was independently analysed by MRC Human Nutrition Research, Cambridge. Some baseline weights were self-reported, all final weights were verified. At baseline median weight was 95.0kg, median BMI was 35.2 kg/m<sup>2</sup>, median age was 49.4 years and 88% of the referrals were women. Patients were considered as dropouts at the first week of non-attendance.

More than half (55%) of referred patients completed the course and median weight loss was 5.2kg (IQR = 2.7-7.5kg). Of these, 54% achieved weight loss of  $\geq 5\%$  and 11%  $\geq 10\%$  of initial weight. Of 1058 courses initiated, 36% resulted in weight loss  $\geq 5\%$  and 7%  $\geq 10\%$  baseline weight. There was no significant difference in outcome by gender, age, BMI or region.

The recorded weight loss may be conservative as some baseline data was self reported (which is subject to under-reporting) and as a consequence this data set has limitations. However these results provide a preliminary insight into the compliance and scale of weight loss which can be achieved in the Weight Watchers referral scheme operating in routine clinical practice.

**Reference:** Heshka S. et al (2003) Weight loss with self-help compared with a structured commercial program: a randomised trial. *JAMA*, 289 (14): 1792-1798.

**Conflict of Interest:** Paula Hunt and Jenny Poulter are independent nutrition consultants who undertake specific projects on behalf of Weight Watchers

**Funding:** Weight Watchers International, Inc.

## T5:PS.223

**Prevalence of Obesity and Characteristics Life Style in Preschool Children of High Socio-economic Families**

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**Introduction:** Life style is an effective factor for development of obesity especially in children. This study was carried out to examine the prevalence of obesity, and to study of the physical activity and food intake pattern of preschool children in high socio-economic families in Tehran.

**Methods:** In a cross sectional study 60 children 2-5 years old were studied, randomly. Height and weight were measured using standard method. The prevalence of overweight and obesity was calculated using two physical growth indicators such as weight for age (W/A) and weight for height (W/H). Children's levels of physical activity pattern and frequency food intake were assessed through questionnaires. Levels of inactivity were assessed using the mother's report of the time the children spent watching TV, playing computer games and sleeping time.

**Results:** 33% & 38% of children were obese and overweight, respectively. 55% of children had physical activity. 30% played computer games. In 59% of children total hours of TV and computer viewing was in the acceptable range. Mean sleeping time in 62% was acceptable. 80% of children did not have daily intake of meat and vegetables groups and 67% of children had highest intake level of dairy products and fruit.

**Conclusion:** Obesity and overweight are high in these children and it is accompanied by different level of inactivity, imbalance of food intake as a usual characteristic of the life style in this population. Administration of targeted health programs in different level of community with focus on the empowerment of mothers is necessary.

## T5:PS.222

**Assessment of overweight and obesity prevalence of 20-50 years old women living in north of Tehran Iran, 2007, and it's relation with family history of overweight and obesity.**Rezazadeh Sarabi A<sup>1</sup>, Rashidkhani B<sup>1</sup>, Omidvar N<sup>1</sup>, Hoshyar rad A<sup>1</sup><sup>1</sup>National Nutrition and Food Technology Research Institute, Shahid beheshti university of medical sciences and health services, Tehran, Iran

**Introduction:** Prevalence of obesity is enhancing in the majority of countries and also in developing countries like Iran. So, the aim of this study is determination of overweight and obesity prevalence of 20-50 years old women in north of Tehran, Iran, 2007 and it's relation with family history of overweight and obesity.

**Material and method:** In this cross-sectional study 460, 20-50 years old women living in the north of Tehran were sampled with clustered systematic method. Anthropometric factors (weight, height, waist) were measured by standard method and Body Mass Index (BMI) was calculated. Family history of obesity (F.H.O) was defined as having at least 1 overweight or obese first degree relative (mother, father, child, sister and brother). Data were analyzed by SPSS software (version 13).

**Results:** The mean of women's age (year) was  $33.5 \pm 9.84$ , weight (Kg)  $67.04 \pm 13.48$ , height (m)  $1.58 \pm 0.06$ , BMI  $26.6 \pm 5.48$  and waist  $86.07 \pm 35.65$ . 8% of women were underweight, 38.5% overweight and 23.3% obese. 46.5% had F.H.O. Women without F.H.O significantly ( $P < 0.05$ ) had 35% less odds for overweight and obesity ( $BMI \geq 30$ ) in comparison with Women with F.H.O (OR: 0.65, CI: 95%; 0.44 - 0.96) and 49% less odds for central obesity (waist  $> 88$  cm) (OR: 0.51, CI: 95%; 0.35 - 0.76).

**Conclusion:** Results suggest that overweight and obesity, especially central obesity, is considerable in these women especially in subjects with F.H.O. So performance of suitable programs for preventing of overweight and obesity in these women is necessary.

**Key words:** prevalence, obesity, overweight, Family history of obesity, women

## T5:PS.224

**A 5-min Physical Activity check list designed for General Practitioners**Durrer Schutz<sup>1</sup>, D, Schutz, Y<sup>1,2</sup><sup>1</sup>Eurobesitas Swiss, Vevey; <sup>2</sup>Department of Physiology, Lausanne University, Switzerland

General Practitioners (GP's) play a critical role in physical activity (PA) prescription. However, their knowledge on the evaluation of PA is rather scanty and at least in Switzerland the time available to do it is extremely limited. The objective was to develop a quick questionnaire in order to make aware the GP's about the different components of PA and to know which component could be enhanced. 80 patients of normal to obese BMIs were studied in a single general practice. First, the patients were all interviewed by one GP, using the 5-min-PA. The latter was based on 8 items, selectively exploring the components of daily PA (occupational, non-occupational, transport, leisure, sports) and inactivity (TV, computer, sitting activities). It used a simple scoring system, which allows combining inactivity (- points) to activity factors (+ points) to get a global picture of PA. It used only 3 categories: Low (L), Medium (M) and high (H) PA. The validity of the questionnaire was checked using an objective estimate of PA (electronic pedometers) assessing total number of steps/day over one consecutive week. L level corresponded to 3'460 steps/d (range: 1'844-5'786), M to 7'210 steps/d (5'082-9'210) & H to 10'320 steps/d (7'228-14'213), with a significant difference among groups (ANOVA,  $p < .01$ ). This global PA assessment check list allows distinguishing 3 broad categories of PA. Acceptance of this questionnaire by GP's remains to be further determined. It could improve awareness and may provide some help for the the diagnosis and prescription of PA in inactive overweight and obese patients.

## T5:PS.225

## Feeding mode and differences in the growth of Croatian infants

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Despite the high prevalence of obesity among children and adults in industrialized countries, the causes of obesity are poorly elucidated. Among others, infant feeding mode may have a role in later development of obesity. Researchers have hypothesized that breast-feeding may be protective against obesity later in life, but the evidences are inconclusive. In this study data were collected by retrospective insight into medical charts of 203 infants from rural part of Eastern Croatia. Data encompassed infant feeding mode (based on a mother's self-report) and anthropometric parameters (body weight, length) collected at regular intervals (birth, 1, 3, 6, 9, 12 months). The infants were divided into 4 groups: infants exclusively breast-fed until 6 months of age, formula fed infants, infants exclusively breast-fed until 4 months and then fed by formula, and infants fed by cow's milk. Anthropometric characteristics of all infant groups were similar at birth, but after 6 and 12 months period group of those exclusively breast-fed until the 4 months of age and then bottle-fed by formula achieved highest weight gain, followed by cow's milk bottle-fed infants, and formula bottle-fed infants, while exclusively breast-fed infants had lowest weight gain. Height gain order was similar. Most of the children in all observed groups achieved weight-for-age and height-for-age prescribed by the National Centre for Health Statistics standards. Due to that fact, tendency of achieving higher percentile values in some of the observed groups, indicating higher possibility of obesity development later across the life-span will be additionally evaluated on the basis of weight-for-height scores and z-scores.

## T5:PS.227

## Obesity and mental disorders

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**Objective:** To describe some features of obese patients that consulted at our Department.

**Method:** 74 obese patients (58.9 % females; mean age: 45.25 years; B.M.I : 47.43) were interviewed. The following tests were administered: Bender, Millon III, M.B.H.I and Rorschach. We evaluated the following variables: anxiety and depression symptoms, impulsivity and control, frustration tolerance, behavior according social norms, kind of bonds, role in interpersonal relationships, ego strength or ego weakness.

**Results:** anxiety: 36.74%; depression: 55%; impulsivity: 27.14% : low frustration tolerance: 31.51%; behavior according social norms: 85.14 %; dependent bond: 50.75%; passive role in interpersonal relationships: 48.53%; ego weakness: 77.03%;

**Conclusion:** Obesity is a chronic disease with a high clinical and psychiatric comorbidity. Discrimination and unsuccessful long-term treatments may cause and/or intensify mental disorders. In our sample, anxiety and depression symptoms stand out and patients show characteristics of ego weakness, emotions constriction, dependence on bonds and a non-appropriate performance to self resources. It would be necessary to consider these aspects into the multidisciplinary approach of the pathology and to go more deeply, in future researches, into its knowledge.

## T5:PS.226

## Melanocortin 4 receptor mutations in Chilean obese subjects

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**Introduction:** Melanocortin 4 receptor gene (MC4R) mutations are the most frequent cause among the rare monogenic forms of human obesity. However, no reports of MC4R mutations are available in South America populations.

**Aim:** to estimate the frequency of MC4R variants in Chilean obese children and adults.

**Subjects and Methods:** We have selected 160 Chilean obese children (6-12 years-old; BMI above p95 according to NCHS/CDC 2000) and 23 Chilean obese adult women (age range: 25-73 years old; Body Mass Index -BMI- range: 31-54 Kg./m<sup>2</sup>). The single exon of MC4R gene (geneID 4160; 18q22) was amplified through Polymerase Chain Reaction (PCR) and sequenced using two overlapping PCR products. Additionally, Single Strand Conformational Polymorphism analysis (SSCP) and Restriction Fragment Length Polymorphism (RFLP) analysis were carried out in some DNA samples to search/confirm the presence of genetic variants.

**Results:** A 449C>T (Thr150Ile) substitution, previously described in populations of South European countries, was identified in heterozygous status in an obese woman (BMI = 41.2 Kg/m<sup>2</sup>; % body fat = 38.7%) through SSCP techniques and direct sequencing followed by a confirmation using PCR-RFLP. The observation of adiposity indexes in a three-generation family ascertained through the index case suggested a co-segregation of the 150Ile variant with severe obesity. Additionally, two obese children were detected as carriers of the Val103Ile variant in MC4R gene.

**Conclusion:** We have estimated a low frequency of MC4R mutations in Chilean obese subjects and a co-segregation of Thr150Ile with severe obesity in a three generation Chilean family. Supported by FONDECYT 1061096.

## T5:PS.228

## A prospective study of dietary energy density and weight gain in women

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**Background:** Little is known about the long-term effects of dietary energy density (ED) on weight gain.

**Objective:** To assess the long-term relationship between changes of dietary ED and age-related weight gain.

**Methods:** We conducted a prospective study of 50,026 women (mean age: 36.5; SD: 4.6) in the Nurses' Health Study II followed from 1991 to 1999. Dietary ED and body weight were ascertained in 1991, 1995, and 1999. Total dietary ED was calculated by dividing each subject's daily energy intake (kcal) by the reported weight (g) of all foods consumed.

**Results:** Dietary ED was positively correlated with saturated fat ( $r=0.16$ ), *trans* fat ( $r=0.15$ ), and the glycemic index ( $r=0.16$ ), but inversely correlated with vegetable protein ( $r=-0.30$ ), vegetables ( $r=-0.27$ ), and fruits ( $r=-0.17$ ). Women who increased their dietary ED during follow-up the most (5<sup>th</sup> quintile) had a significantly greater multivariate-adjusted weight gain as compared with those who most decreased their dietary ED (1<sup>st</sup> quintile) (8-y time period: 6.42 kg versus 4.57 kg;  $p$  for trend < 0.001). However, the amount of weight change over time varied considerably according to the ED of individual foods and beverages.

**Conclusion:** Increases in total dietary ED were associated with long-term weight gain among middle-aged women. However, public health recommendations cannot be made simply based on ED values of individual foods and beverages only. Reducing consumption of foods high in saturated and *trans* fats and refined carbohydrates and increasing fruits and vegetables consumption may help to reduce dietary ED and prevent weight gain.

**Conflict of interest:** The funding organizations had no role in the design and conduction of the study; in the collection, analysis, and interpretation of the data; and in the preparation, review, or approval of the manuscript.

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