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Juan Rivera (Peru), President  
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## USE OF HYDROCORTISONE VERSUS PLACEBO IN REFRACTORY ARTERIAL HYPOTENSION IN TERM INFANTS.

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Arterial hypotension is a common sign in critically ill infants. Several clinical studies showed that short series of corticoids increases arterial blood pressure and reduces inotropic requirement in preterm infants with arterial hypotension. There are few reports regarding the use of hydrocortisone (HC) for the treatment of refractory hypotension in Term infants (TI). **Objective:** To evaluate the effectiveness of HC versus placebo to reduce inotropic support in infants with refractory arterial hypotension and to evaluate urine output, mortality and the presence of adverse effects. **Population:** TI with dopamine requirements  $\geq 14 \mu\text{g}/\text{kg}/\text{min}$  and/or adrenalin. **Design:** Prospective, controlled, randomized, double blind study with placebo. Inform consent was required. Randomization with blocs and concealment allocation. Primary outcome: 50% inotropic dose reduction at 48 hs; 25 patients in each group (Placebo Group = PG, Intervention Group = IG),  $\alpha = 0.05$  and  $\beta = 80\%$ . GI = HC: 2.5 mg/kg doses every 12 hs, 4 doses or PG: saline solution 1.25 ml/kg/dose EV. The data were analyzed according to intention to treat. Statistics analyses: tables of frequency, student t test and Chi2. **Results:** We didn't found statistical significant differences between groups in the following variables: age, hospitalization weight, male sex, initial dopamine dose, adrenaline infusion and diagnosis. The 48hs inotropic support was lower in IG = 60% vs PG: 24% ( $p = 0.009$ , RR = 2.5 CI95% 1,16 a 5,38). The urine output increased: IG: 56%, PG: 40% ( $p = 0.2$ , RR: 1.4 CI95% 0.77-2.5). IG mortality was 36% and PG mortality: 64% ( $p = 0.04$ , RR: 0.56 CI95% 0,3-1). Hyperglycemia was present in 36% IG versus 24% in GP ( $p = 0.35$ , RR: 1.5 CI95% 0.6-3.5). **Conclusion:** Administration of HC in patients with refractory hypotension showed a reduction of inotropic support. It is necessary further studies to recommend this practice.

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## SERUM LIPIDS IN HEALTHY CHILEAN SCHOOLCHILDREN AND ADOLESCENTS.

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**Background:** Increased serum lipids are one of the emergent public health problems in Pediatrics, associated to the consequences for the adult life. No information is available nowadays about serum lipids in healthy Chilean children and adolescents. **Objectives:** To assess serum lipids concentrations in schoolchildren and adolescents of middle-high socioeconomic groups in Santiago, Chile. **Subjects and Methods:** We evaluated 195 healthy children and adolescents among 5 and 16 years old, both gender, in a private clinic in Santiago, Chile, which attends to middle and high socioeconomic groups. After a written consent by parents and children, a blood sample was drawn in fasting condition. Weight, height, and abdominal circumference were also measured. **Results:** The BMI in girls ranged between 13.6 and 24.0; in males between 12.9 and 26.2; the abdominal circumference ranged among 49 and 79.5 cm in girls (5-10y), and among 51 and 78 cm in boys. The total cholesterol (TC) among schoolchildren (6-11 y) was comparable between boys and girls: TC ( $169.1 \pm 25.1$  vs  $165.2 \pm 25.4$  mg/dL), LDL ( $101.1 \pm 20.9$  vs  $96.5 \pm 22.8$  mg/dL), HDL ( $54.6 \pm 12.4$  vs  $55.3 \pm 12.0$  mg/dL) and triglycerides ( $70.0 \pm 26.4$  vs  $66.1 \pm 31.8$  mg/dL). Between 12 and 16 y the TC was higher in females than in males ( $179.1 \pm 23.7$  vs  $150.2 \pm 28.5$  mg/dL;  $p < 0.001$ ), and also the LDL ( $104.4 \pm 29.9$  vs  $83.9 \pm 22.6$  mg/dL,  $p < 0.001$ ). The rate of increased TC ( $> 200$  mg/dL) was 12% of females and 5% of males (NS); the rate of TC in the at risk range (170-200 mg/dL) was 42% in males 6-11 y, and 22% between 12 and 16 y, 33% of females between 6 and 10 y and 35% between 11 and 16 years. **Discussion and Conclusions:** Mean serum lipids are within normal ranges for these ages. However a significant rate of children and adolescents present increased or at risk cholesterol and LDL levels. Adolescent girls present greater cholesterol levels than males. No association among serum lipids and BMI or abdominal circumference was found.

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## CADMIUM EXPOSURE DURING PREGNANCY INDUCES ENDOTHELIAL DYSFUNCTION AND CARDIOVASCULAR PROGRAMMING IN ADULT OFFSPRING.

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**Introduction:** The environment in which the fetus develops is critical for its survival, development and long-term health. A suboptimal fetal environment during pregnancy induces fetal programming, increasing the risk of diseases later in the adult life. We hypothesized that cadmium (Cd<sup>2+</sup>) exposure during pregnancy induces endothelial dysfunction and fetal programming of cardiovascular disease in the adult life. **Methods:** virgin female Wistar rats were exposed to Cd<sup>2+</sup> (30 ppm) during the whole gestational period (21 days) in drinking water. Cadmium concentration was determined in placentas, offspring, aortas and maternal milk by ICP-MS. In the offspring (F1) at 60 days, vascular reactivity in aortic rings – as an endothelial function parameter – was measured. Also, Doppler echocardiography and myocardium histology were evaluated. **Results:** Cd<sup>2+</sup> was detected only in placentas ( $1.12 \pm 0.24 \mu\text{g}/\text{g}$ ); in fetus, aorta and milk, Cd<sup>2+</sup> levels were under detection limits. Aortic rings from Cd<sup>2+</sup>-treated rats registered a decreased relaxation response induced by acetylcholine indicating endothelial damage. In treated animals, a significant decrease of the left ventricular cavity size in diastole was observed ( $0.49$  vs  $0.59$  mm), which was associated to an anterior wall thickening in diastole and systole ( $3.5$  vs  $2.6$  mm and  $2$  vs  $1.5$  mm respectively) without commitment of the cavity in systole and the ejected volume. Also, a thickening of the aortic wall ( $0.69$  vs  $0.45$  mm) without lumen changes was found. The myocardium histology evidenced normal architecture of myocytes in the Cd<sup>2+</sup>-treated offspring, but increased number and size of vascular structures suggesting increased angiogenesis. **Discussion:** Prenatal exposure to Cd<sup>2+</sup> (30 ppm) induces in the offspring at the adult age an endothelial dysfunction and a fetal programming of cardiovascular development which are probably due to a Cd<sup>2+</sup>-induced placental dysfunction and not to a direct effect of Cd<sup>2+</sup> in the fetus.

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## IMPACT OF MATERNAL VITAMIN A SUPPLEMENTATION ON MOTHER-INFANT PAIR: A RANDOMIZED DOUBLE-BLIND PLACEBO-CONTROLLED TRIAL.

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**Background:** Vitamin A deficiency (VAD) is a severe public health problem in many regions of the world, affecting mainly the mother-infant group and increasing the childhood morbimortality. The maternal supplementation can be an effective strategy to combat this problem. **Objective:** To evaluate the impact of maternal vitamin A supplementation on VAD and retinol concentrations of serum and breast milk. **Subjects and Methods:** 33 lactating women received capsules with 200,000 IU of vitamin A between the 20th day and the 30th day after delivery and 33 lactating women received identical capsules with soybean oil (placebo). Maternal blood and milk were collected before (T0) and after (T1) the intervention (three months after delivery). Infants' blood was collected at three months old. Retinol was determined by HPLC and levels lower than  $0.70 \mu\text{mol}/\text{l}$  (serum) and  $1.05 \mu\text{mol}/\text{l}$  (milk) indicated VAD. **Results:** 61 mother-infant pairs concluded the study. In supplemented mothers, the serum retinol concentration increased from  $1.05 \pm 0.31 \mu\text{mol}/\text{l}$  at T0 to  $1.17 \pm 0.34 \mu\text{mol}/\text{l}$  at T1 ( $p = 0.026$ ), showing statistically significant difference in relation to placebo group, whose mean was  $1.02 \pm 0.28 \mu\text{mol}/\text{l}$  ( $p = 0.032$ ). In breast milk, there was significant reduction of retinol concentration only in the placebo group ( $1.98 \pm 0.78 \mu\text{mol}/\text{l}$  at T0 and  $1.34 \pm 0.89 \mu\text{mol}/\text{l}$  at T1,  $p = 0.003$ ). In infants, there was not statistically difference in retinol means between groups ( $0.64 \pm 0.30 \mu\text{mol}/\text{l}$  and  $0.69 \pm 0.26 \mu\text{mol}/\text{l}$ ). Regarding serum maternal VAD, it was found 6.7% (T0) and 16.7% (T1) in placebo group and 6.5% (T0) and 3.2% (T1) in supplemented group. Breast milk VAD was found in 7.4% (T0) and 55.6% (T1) of the placebo and 22.6% (T0) and 16.1% (T1) of the supplemented group samples. The VAD was present in 66% of infants (69% in the placebo and 63.3% in the supplemented group). **Conclusions:** The maternal supplementation with vitamin A showed positive impact on maternal serum and milk retinol concentration, but it did not reach the infant. High prevalence of VAD was found, mainly in infants from three months old, leading us to question the cut-off point used for this age group.

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### MEASUREMENTS OF GENERAL AND VISCERAL ADIPOSITY IN OBESE AND HEALTHY SCHOOL CHILDREN.

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**Introduction:** Measurements of visceral adiposity may be better associated with metabolic complications than those for general adiposity. No visceral adiposity measurements in healthy children are available. **Objectives:** To describe the measurements of general and visceral adiposity in obese and healthy school children. To analyze the differences among measurements of general and visceral adiposity obtained through anthropometry or abdominal ultrasonography. **Subjects and Methods:** 30 obese (OB) and 30 healthy school children (EU) (6–12 years) of both sexes, in Tanner 1 were studied, in Santiago, Chile. Weight, height and abdominal perimeter (AP) were measured and BMI was calculated. A trained radiologist performed abdominal ultrasound measurements at the L4–L5 level, in fasting of more than 4 h, for: a) segment spina-inner wall of rectus abdominus muscle (VA); b) subcutaneous adiposity; c) hepatic echogenicity. **Results:** The OB had BMI  $24.4 \pm 4.1 \text{ kg/m}^2$  (16.2–36.2), and the EU had  $17.3 \pm 1.4 \text{ kg/m}^2$  (14.3–19.5). The AP in the OB was  $83.0 \pm 9.5 \text{ cm}$  (66–107) and in the EU was  $62.8 \pm 6.9 \text{ cm}$  (51.9–76.0). The VA measurement by abdominal ultrasound for the OB was  $48 \pm 13.1 \text{ mm}$  (19.7–72.7) and  $41 \pm 9.0 \text{ mm}$  (24–64) for the EU ( $p < 0.025$ ). The subcutaneous adiposity was different between OB and EU ( $26.7 \pm 14.5$  vs  $9 \pm 4.3 \text{ mm}$  ( $p < 0.001$ )). The Pearson correlation between AV and BMI for the OB was  $r = 0.458$  and with abdominal perimeter was  $r = 0.597$ ; for the EU were 0.58 and 0.64, respectively. The hepatic echogenicity showed alterations in 20/30 OB and was normal for all healthy school children. **Discussion and Conclusions:** Measurements of visceral adiposity are sufficiently differentiated between obese and healthy school children, but with some overlapping. There is a better correlation between spina-rectus abdominus muscle segment and abdominal perimeter than with BMI. The hepatic echogenicity shows a frequent alteration in obese school children.

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### NUTRITIONAL PROFILE OF INDIGENOUS CHILDREN UNDER FIVE YEARS OLD IN PARAGUAY. INDIGENOUS HOUSEHOLD SURVEY 2008

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**Introduction:** In Paraguay 2% of population are indigenous. Isolated research demonstrates a worse nutritional situation of this population, but there is no national data. **Objective:** To evaluate the nutritional profile of indigenous children under 5 years old in Paraguay. **Methodology:** Descriptive and analytical design based on anthropometric data of children under 5 years old from Indigenous Household Survey 2008 of National Bureau of Statistic, Surveys and Census. The sample was representative at national level and it was analyzed using WHO Anthro 2005 considering WHO criteria. Statistical software SPSS 15.0 was used. **Results:** 16194 cases were analyzed. 46.5% were girls. Average age was of 29 months (0.41–59.7 m). Average of z score were: zWeight/Age (zW/A)  $-0.56 \pm 1.15 \text{ SD}$ , zWeight/Height (zW/H)  $0.64 \pm 1.20 \text{ SD}$  and zHeight/Age (zH/A)  $-1.75 \pm 1.57 \text{ SD}$ . Underweight prevalence (UW, zW/A  $< -2 \text{ SD}$ ) was 9.8% and the risk of UW was 25%. Wasting (W, zW/H  $< -2 \text{ SD}$ ) was of 1.5% and wasting risk was of 5.5%, overweight and obesity were of 28.6% and 9%. Stunting (S, zH/A  $< -2 \text{ SD}$ ) represented 41.7% and stunting risk 29.4%. UW was higher in children  $< 2$  years (12.2% Vs 8.2%;  $\#61539;2 \text{ p} < 0.0001$ ) the same as W (3.6% Vs 0%) and obesity (11.7% Vs 7%); while S was lower in this group (38.1% Vs 44.3%;  $\text{X}^2 \text{ p} < 0.0001$ ). There were no differences by gender regarding UW or S. Out of 5 linguistic families UW was higher in Guarani family (11.7%) followed by Zamuco (10.2%) and Maskoy (7.5%). Wasting was higher in Zamuco (5.1%) and there were  $< 1\%$  in Guaikuru and Matakoy/Mataguay. Obesity was higher than 14% for the Maskoy, Zamuco and Matakoy/Mataguay families, the rest had less than 7%. S was higher in the Guarani (46.4%), Zamuco (39%) and Matakoy/Mataguay (37%) families. **Conclusion:** In this indigenous child population there was malnutrition by deficit (due to underweight and stunting) as well as by excess mainly in children under 2 years old. The linguistic families Guarani and Zamuco showed higher nutritional problems.

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### VALIDATION OF A CLINICAL PREDICTION RULE TO DISTINGUISH BACTERIAL FROM ASEPTIC MENINGITIS.

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**Introduction:** Despite most meningitis are not bacterial, because it is difficult to rule-out bacterial meningitis, antibiotics are usually administered on admission. To distinguish bacterial from aseptic meningitis on admission could avoid inappropriate antibiotic use and hospitalization. We aimed to validate the clinical prediction rule to distinguish bacterial from aseptic meningitis developed by Nigrovic (2002). **Methods:** This prospective study included patients aged one month to nineteen years with meningitis, admitted to Elizalde Hospital between September 2006 and October 2007. Cerebrospinal fluid (CSF) and peripheral blood neutrophil count were obtained from all patients. The Nigrovic clinical prediction rule was calculated according to the following criteria: positive CSF Gram stain = 2 points, CSF absolute neutrophil count  $\times 1000 \text{ cells/mm}^3 = 1$  point, CSF protein  $\times 80 \text{ mg/dl} = 1$  point, peripheral blood absolute neutrophil count  $\times 10,000/\text{mm}^3 = 1$  point, seizure = 1 point. Patients with score = 0 were classified as very low risk of bacterial meningitis and those with score  $\geq 2$  were classified at high risk. Sensitivity (S), specificity (E), predictive values (PPV and NPV), likelihood ratios (PLR and NLR) were calculated with 95% confidence intervals. Informed consent from all participants was obtained. **Results:** 70 patients with meningitis were included, 14 of these were bacterial meningitis. When Nigrovic score was calculated, 25 patients presented score = 0 points, 11 score = 1 point, and 34 score  $\geq 2$  points. A score = 0 showed S: 100%, E: 44%, VPP: 31%, VP: 100%, RVP: 1.81% RVN: 0%. A score  $\geq 2$  predicted bacterial meningitis with S: 100%, E: 64%, VPP: 41%, VP: 100%, PLR: 2.8, NLR: 0. **Discussion:** Using Nigrovic score was simple, and allowed identifying children with very low risk of bacterial meningitis. It could be a useful tool to assist clinical decision making.

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### THE ENDOCANNABINOID CB<sub>1</sub> RECEPTOR ANTAGONIST, SR141716A, HAS PARADOXICAL EFFECTS ON ADULT BODY WEIGHT AND METABOLIC ALTERATIONS DUE TO EARLY POST-NATAL STRESS. AN ANIMAL MODEL

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**Introduction:** Metabolic plasticity allows that adverse perinatal conditions could be later expressed, generating a permanent dysfunction during adult life. In animal models, it has been demonstrated that stress during lactation induces metabolic disruption (MD) and overweight in adulthood. The aim of this study was to evaluate whether CB<sub>1</sub> endocannabinoid receptors (CB<sub>1</sub>ER) are involved in those alterations. With this purpose, an early post-natal stress animal model (EPNS) was challenged with the CB<sub>1</sub>ER antagonist, SR141716A (SR), to evaluate the answer to the treatment with this drug. **Methods:** Male CD-1 mice pups were randomly distributed for a random maternal cross-fostering. During lactation (21 days) pups were stressed with a subcutaneous injection of saline solution and simultaneously, a dose of SR was orally given (1  $\mu\text{g/g}$  body weight). Solvent of SR was given to control pups. Some animals were sacrificed at day 21 to evaluate plasma corticosterone. Subsequently, SR non-treated EPNS animals were daily-treated with an oral dose of SR from day 40 to 130. Adult animals were then sacrificed to evaluate body weight, epididymal fat and some other metabolic parameters. **Results:** In our animal model, EPNS significantly increased body weight (7%) and epididymal fat weights (29%) in adulthood. Increased levels of leptin ( $11.1 \pm 2.2$  vs  $19.7 \pm 2.1 \text{ ng/ml}$ , mean  $\pm$  SEM), corticosterone ( $8.1 \pm 2.95$  vs  $35.5 \pm 11 \text{ ng/ml}$ ), and triglycerides ( $89.6 \pm 9.9$  vs  $115.8 \pm 10.3 \text{ mg/dl}$ ) were also found. Daily chronic treatment with SR (40–130 days) normalizes these parameters. In addition, this treatment also reduces levels of glucose, insulin and total cholesterol in blood, with no changes in food intake. Unexpectedly, treatment with SR during lactation produces a marked overweight (+18%), high levels of glucose (+55%) and insulin (+200%), together with an increased accumulative food intake in EPNS animals (130 days) when compared to those SR non-treated EPNS animals. **Discussion:** CB<sub>1</sub>ER may be involved in adult overweight and MD due to EPNS and early SR treatment. It is suggested that CB<sub>1</sub>ER expression undergo a post-natal, stress-induced “reprogramming” in tissues involved in energy homeostasis, which is exacerbated by early treatment with SR. (Support: FONDECYT-CHILE 1070663).

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### ALCOHOL, TOBACCO AND MARIJUANA CONSUMPTION AMONG CHILEAN YOUTH ALCOHOL, TOBACCO AND MARIJUANA CONSUMPTION AMONG CHILEAN YOUTH

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**Background:** The consumption of tobacco, alcohol, and marijuana among youth has been increasing worldwide. However, findings from recent studies in Chile suggest that the age of onset is beginning earlier with younger cohorts when compared to other Latin American countries. The earlier the youth begin using, the greater the risk of becoming a regular user. Risk factors have been identified and include individual characteristics as well as school, family, and social influences. **Objectives:** a) To identify age of onset and percent of youth who consume alcohol, tobacco, and marijuana; b) To identify risk factors that may be associated with increased risk of use. **METHOD:** A total of 284 youth, ages 12–16 years old living in Santiago Chile, were assessed using a comprehensive battery of questions. The assessments were conducted by psychologists and included questions about drug consumption, relationship with parents, self-esteem, religion, violence, health, and school-related factors. **Results:** A high proportion of youth reported consuming substances in their lifetime. Specifically, 40.1% consumed alcohol, 38.4% cigarettes, and 10.6% marijuana. The corresponding age of first use is 12.5, 12.1 and 13.8 years of age, respectively. No significant differences in percentage or age of onset for boys and girls who use these substances were identified. Logistic regression models were utilized to test the hypotheses. Results indicate that age is positively associated with use of alcohol (Odds Ratio [OR] = 1.91,  $p < .0001$ ), tobacco (OR = 2.31,  $p < .0001$ ), and marijuana (OR = 9.19,  $p < 0.0001$ ). Youth who are risk takers and/or engage in more antisocial behaviors also have higher risk of consuming alcohol (OR = 1.16,  $p < .001$ ) and smoking cigarettes (OR = 1.12,  $p < .05$ ). Youth who have better relationships with their fathers are less likely to smoke cigarettes (OR = 0.96,  $p < .05$ ). Also, risk of marijuana use decreases with increased parental supervision (OR = 0.85,  $p < .01$ ). **Discussion:** These findings clearly indicate that substance use is associated with youth becoming adolescents and acquiring freedom and less supervision that results in increased opportunities to use substances. Nonetheless, the findings indicate that positive relations with parents and adequate parental supervision can serve to ameliorate the risk of drug use, even among adolescents. Financing: NIDA ROI DAD21181.

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### BULLYING IN SECONDARY PUBLIC SCHOOLS IN PERÚ

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Bullying is a common aggressive behavior occurring in the whole world that leads to health problems in victims. **Objective:** To know the frequency, types, and associated risk factors for bullying in students of secondary public schools of Lima, Ayacucho, Huancavelica, Cusco and Satipo-Junin (Coast, Highland and Jungle regions). **Methodology:** Analytic cross-sectional study, pointing the bully and victim characteristics of aggression. We selected the sample in each school and the classrooms were elected by chance. We elaborated a questionnaire, whose validity was checked for experts and the reliability was done using the Cronbach alpha with an  $r = 0.73$  from a previous study. **Statistical analysis** of association and logistic regression were performed. **Results:** There were 1,656 students, 50.7% of them had bullying. After logistic regression analysis, the variables associated with bullying were: insults 2,10 (CI: 1,60-2,70); beats 2,0 (CI: 1,40-2,80); harass 3,30 (CI: 2,30-4,70) spitted 2,10 (CI: 1,20-3,70); discrimination 1,40 (CI: 1,00-1,90); forced to do things 2,10 (CI: 1,40-3,20). Risk factors significantly associated were: physical defect 1,97 (CI: 1,55-2,51); don't communicate 2,10 (CI: 1,60-2,60); need to work 1,75 (CI: 1,44-2,14) and need of medical attention 1,40 (CI: 1,00-1,80). The area under the ROC curve was 0,76 (limits 0,73-0,78). **Conclusion:** Bullying was present in 50,7% of students. Types of aggression significantly associated were insults, beats, harassment, spitting, discrimination, and forced to do things. Associated risk factors were physical defects, no communication of aggression and need to work. Need of medical assistance has been also positively associated with bullying.

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### IMPACT OF LATE LIGATURE OF UMBILICAL CORD IN HEMOGLOBIN LEVELS AND GROWTH IN INFANTS FROM HIGHLANDS OF CUSCO, PERU.

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**Objective:** To evaluate the impact of late umbilical ligature on both, hemoglobin levels and growth, in infants born in the highlands (3,400 meters above sea level) of Cusco, Peru. **Material and Methods:** We compared hemoglobin values and anthropometric patterns in 88 healthy children from 0 to 4 months whose umbilical cord were randomized to either early postpartum or late ligature (3rd minute). There were 44 infants in each group. **Results:** The average of hemoglobin level in newborns with late umbilical ligature was 20.3 gr/dl, compared with 16.5 gr/dl in children with early ligature ( $p < 0.05$ ). At fourth month of age, hemoglobin level was 13.6 gr/dl and 12.5 gr/dl respectively, and the prevalence of anemia was 90.9% in the control group (early ligature) and 34.1% in the experimental group (late ligature). There was a correlation between the weight and the hemoglobin level ( $r = 0.348$ ,  $p < 0.05$ ), so it is being deduced that it increases 280 gr for each gram per deciliter of hemoglobin. **Discussion and Conclusions:** The time of ligature of the umbilical cord determines the children's hemoglobin level, independently of the maternal hemoglobin, and the risk of anemia at the fourth month of postnatal age is 2.6 times greater in the infants with early ligature. Late ligature of the umbilical cord prevented anemia in 100% during the newborn period, and in 62% of infants at the fourth month of age. It is also expected that late ligature increases 280 gr of weight per gram of hemoglobin.

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### IMPACT OF PERINATAL HEALTH INTERVENTIONS ON NEONATAL MORTALITY IN PERU - 2004. A SIMULATION MODEL USING DHS COVERAGE.

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**Introduction:** Neonatal mortality reduction can be achieved with effective interventions at relatively low cost. In this context, our objective was to explain neonatal mortality variation in Peru from 2000 to 2004, in order to assess the contribution of coverage reported by the Demographic and Health Survey (DHS). **Methods:** We developed a simulation model which combines the impact of twelve intervention's coverage, in different regions under perinatal care. The interventions selected were based in the current best evidence of their impact over maternal and neonatal care in our country, and all of them were available at DHS 2000 and 2004. We performed a Monte Carlo simulation to quantify which interventions were contributing with how many survivors, and then we estimated the resultant variation on neonatal mortality rate. Thereafter, under a sensitivity analysis, we made a ranking for interventions according to their contributions to decrease of neonatal mortality. **Results:** The model predicted, through 3000 trials, the likelihood of different neonatal mortality rates for 2004, considering two scenarios: conservative and optimistic. In a conservative scenario, with a 90% probability, neonatal mortality rate in Peru was estimated below 13.4 per 1000 live births. This represents a reduction of nearly five points lower than percentage reported in 2000. The intervention with major impact on neonatal mortality in our country in 2004 was the birth place, namely the hospital births. Our optimistic scenario predicts unrealistic results. **Conclusions:** The perinatal health interventions verifiable by survey coverage, and simulations of their impact by quantification of surviving infants, could explain the decreased neonatal mortality rate in Peru from 2000 to 2004. Financial support provided by Macro International Inc. in coordination with Instituto Nacional de Estadística e Informática. INEI Lima, Peru.

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### POSTNATAL GROWTH RESTRICTION IN VERY LOW BIRTH WEIGHT NEWBORN INFANTS. A MULTI-VARIATED MODEL ANALYSIS.

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**Introduction:** At 40 weeks of post-menstrual age (PMA), preterm infants born with very low weight (VLBW) frequently shown extra uterine growth restriction (EUGR) process, which affects, in variable proportions, weight (W), body length (L) and head circumference (HC). **Objective:** To analyze clinical factors associated with low weight, low BL and HC at 40 weeks of PMA. **Methods:** Cohort study. Inclusion criteria: inborn infants with gestational age (GA)  $< 32$  weeks and BW  $< 1500$  g, analysed until 40 weeks of PMA. Exclusion criteria: major congenital malformations, confirmed intrauterine infections and patients transferred to another hospital before 40 weeks PMA. Statistical analysis: three logistical regression models were constructed. **Results:** From 08/2001 to 11/2005, 339 preterm infants were born, 238 met the inclusion criteria. Mean BW was 1144 g (SD 234 g), mean GA: 28.4 weeks (SD 1.66 w); low BW frequency ( $< 10$ th Pc) was 9.2%; CRIB Score  $> 5$ : 11.3%; bronchopulmonary dysplasia (BPD): 36.6%; late onset sepsis (LOS): 26.9%; necrotizing enterocolitis (NEC): 1.7%; patent ductus arteriosus (PDA): 46.6% and combined morbidity (PDA, BPD and LOS): 60.1%. Weight, BL and HC frequency lower than 10 th percentile at 40 weeks of PMA were respectively 52%, 8% and 47%. The multivariate analysis showed the following variables as predictors of W, L and HC lower 10 th percentile at 40 weeks of PMA: Variables predictors of Low W OR IC 95% GA 2.01 1.52-2.66 Combined Morbidity 2.85 1.43-5.69 Birth Weight 0.53 0.43-0.66 Caloric Deficit 1.13 1.04-1.23 Variables predictors of short L OR IC 95% Birth Weight 0.54 0.44-0.66 Gestational Age 1.58 1.22-2.03 Male Gender 2.39 1.26-4.54 Combined Morbidity 3.09 1.6-5.96 Variables predictors of Low HC OR IC 95% Birth Weight 0.62 0.54-0.83 Gestational Age 1.58 1.76-23.23 **Conclusions:** In this population, associated morbidity (PDA, BPD and LOS), low birth weight, lower gestational age, male gender and caloric deficit explain EUGR as well as low BL and HC at 40 weeks of PMA. We speculate that preventing postnatal undernourishment will only be possible with the implementation of new nutritional practices and other strategies intended to reduce co morbidities in this high risk population.

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### THE ASSOCIATION BETWEEN PRENATAL STRESS AND PRETERM DELIVERY: AN INTERDISCIPLINARY RESEARCH.

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Evidence show that there is a relationship between perinatal life events, stress and adverse pregnancy outcomes, including preterm delivery. The present study was aimed to evaluate the relationship between psycho-social stress, preterm delivery and coping strategies among pregnant women that gave birth at Materno Infantil Ramon Sardáa Hospital of Buenos Aires between 2005 and 2007. This is a prospective, case-control study. Quantitative and qualitative investigation techniques (focus groups and semi-structure interviews) have been put into practice with the objective of identifying the life events perceived by the puerperal women, as well as coping strategies. The outcome of the qualitative module was used to design an anonymous auto-administrated survey that was applied to a representative number of mothers (102 preterm births [ $< 37$  gestational weeks, cases] and 100 term births [ $> 37$  gestational weeks, controls]) during the immediate puerperium. Using multivariable logistic regression analysis, the following conditions during pregnancy were significantly associated with preterm delivery: distressed (OR 1.70; [95% CI 1.08, 2.31],  $p = 0.014$ ), and crying (OR 1.98; [95% CI 1.32, 2.65]  $p = 0.021$ ). Higher frequencies, but no significant different, were noted between the groups (preterm vs term pregnancies) regarding stressful life events such as move out (34% vs 26%), home violence (15% vs 9%) and poor family environment (15.6% vs 13%). In conclusion, the present study shows evidence that, according to the multifactorial model of preterm delivery, social and psychological perspective of stress may play an important role in this adverse perinatal outcome as well as develop strategies aimed at preventing premature labor and improving the health of both the mother and the child.

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### NUTRITIONAL STATUS OF ADOLESCENTS IN COMMAND OF THE ARMY AVIATION OF THE CITY OF TAUBATÉ, BRAZIL.

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**Introduction:** Since the first half of the nineteenth century, researchers from various fields of knowledge have analyzed anthropometric data from military sources to investigate human health and its relations with the historical and social development. **Objective:** To investigate the nutritional status of adolescents listed in command of army aviation in the city of Taubaté and identify possible differences between those deemed suitable and those considered unfit for military service. **Methods:** This study involved 1917 adolescents from 17.5 to 19.6 years old, whereas 883 were deemed suitable for military service and 1034 were considered unfit. Measures were taken to weight (Scale Tech Line) and height (Stadiometer Sanny) for calculating the body mass index (BMI), using the cut-off proposed by the World Health Organization (WHO, 1997) for assessment of nutritional status. The comparison between groups was made by chi-square test and statistical significance was defined as  $p < 0.05$ . **Results:** In total, 20.6% of adolescents had excess of body fat, 12.1% in overweight and 8.5% in obesity. In the comparison of the groups, the low weight was observed in 4.2% of able to military service and 4.9% of unfit to military service ( $p = 0.462$ ); overweight was present in 12.3% of able and 11.8% of unfit ( $p = 0.738$ ); obesity, was present in 5.4% of the able and 11.0% of unfit ( $p = 0.000$ ). **Conclusion:** With the analysis of the results we concluded that the proportion of adolescents with excess body fat was high, and obesity was significantly greater among those unfit for military service.

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### DOES ADOLESCENT PREGNANCY TEND TO REPEAT ACROSS GENERATIONS?

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Adolescent pregnancy is highly prevalent in developing countries. It is associated with poverty, induced abortion and maternal and infant mortality. It is described that a non-desirable pregnancy is repeated in the next generation and that mother's low schooling level is associated with premature pregnancy in the next generation. **Objective:** To analyze the intergenerational occurrence of adolescent pregnancy and its relation with socioeconomic and biological factors in a cohort of women born in the Southeast region of Brazil. **Methods:** Questionnaires were applied to women who gave birth to a singleton female child born in 1978/79 in the cohort of Ribeirão Preto (first generation). These daughters were interviewed in 2002/04 (second generation), in a total of 1059 pairs of mothers and daughters evaluated. The questions comprised information about variables of the first generation teenage pregnancies (age at first delivery - adolescent mother or not - schooling level and the occupation of the head of the family) and variables of the second generation (age at first delivery, if it had already occurred: adolescent mothers, not adolescent mothers and women who were not mothers yet; age when started working, skin color and age at menarche). The association between first generation mother's age at first delivery and adolescent pregnancy in the second generation mothers was assessed by means of uni and multivariable Poisson regression models. The other variables were considered as confounders. **Results:** Among the 1059 studied pairs there were 333 (31.4%) adolescent mothers in the first generation and 181 (17.1%) in the second generation. When the first generation mothers were adolescent at their first delivery, their daughters presented a relative risk (RR) of being also an adolescent mother of 2.10 (95%CI: 1.58-2.82) and this association remained significant (RR 1.57; 95%CI: 1.16-2.13) after adjustments. Maternal schooling of the first generation higher than 9 years of study and work starting after 14 years of age in the second generation had a protective effect on teenage pregnancy in the second generation of women. **Conclusions:** Women born to adolescent mothers are more prone to become adolescent mothers. Repeated teenage pregnancies across generations seem to be related to social circumstances.

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### FACTORS ASSOCIATED WITH VIROLOGICAL FAILURE AFTER SIX MONTHS OF HIGHLY ACTIVE ANTIRETROVIRAL THERAPY IN HIV-INFECTED CHILDREN, LIMA-PERU.

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**Objective:** To determine the factors associated with highly active antiretroviral therapy (HAART) failure in HIV-infected children treated by the Infectious Disease Service of Instituto Nacional de Salud del Niño and the Pediatric Service of Hospital Arzobispo Loayza. **Materials and Methods:** Case - Control study. Cases were composed of HIV-infected patients on HAART with failed response to therapy (viral load detectable at 24 weeks) and controls were composed of HIV-infected patients with demonstrated successful response to HAART (viral load undetectable at 24 weeks). **Results:** Forty-two patients were included: 21 in cases group and 21 in controls group. Of the 42 patients, 39 (93%) were previously untreated (NAIVE). Thirty eight (90%) of the patients received treatment with zidovudine, lamivudine, and nelfinavir. Chi-squared testing showed no statistically significant association between treatment failure and age of HAART initiation, nutritional status, presence of pneumonia, or presence of tuberculosis. Statistically significant associations were found between treatment failure and percent CD4 lymphocytes lower than 15 ( $p = 0.05$ ) and viral load greater than 35,000 copies ( $p = 0.045$ ). Logistical regression confirmed statistically significant association between viral load and therapeutic failure ( $p = 0.041$ ). **Conclusions:** HIV-infected patients with a CD4 percentage lower than 15% at baseline, were more likely to fail after 6 months of therapy with HAART. Patients with a viral load of greater than 35,000 copies/ml at baseline, were also more likely to fail therapy.

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### INTER-OBSERVER AGREEMENT FOR RADIOGRAPHIC FINDINGS AND THE RELATION TO ETIOLOGIC AGENTS IN CHILDHOOD COMMUNITY-ACQUIRED PNEUMONIA

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**Introduction:** In patients with established pneumonia, inter-observer agreement of chest radiograph for specific radiological patterns is variable. A prospective study was performed from June to December 2006 in order to assess inter-observer agreement for radiographic findings and the relationship of different radiological features with causative pathogens, in children under 5 years with community-acquired pneumonia in Lima and Puno. **Materials and Methods:** Chest radiographs of 193 children with clinical diagnosis and initial radiologic confirmation of pneumonia (enrolled for etiologic profile study) were independently reviewed by 2 pediatric radiologists from the Instituto Nacional de Salud del Niño, Lima, Perú, without other clinical information than age, sex, and the diagnosis of pneumonia, and according to a established report form. Chest radiographs read as normal by one of the 2 radiologists were excluded. Specific radiologic features, such as pattern of infiltrate, extent and location of pneumonia, and presence of pleural effusion were evaluated. Blood cultures for bacterial isolation and additionally polymerase chain reaction for *S. pneumoniae* and *Haemophilus influenzae* identification were performed. For atypical agents, ELISA test (Ig M) was performed, whereas an indirect immuno-fluorescence test and viral cultures from nasal and pharyngeal swabs were performed for viral identification. **Results:** Of 193 enrolled children (94 in Lima and 99 in Puno), 5 chest X-rays were excluded (1 from Lima and 4 from Puno) because they were read as normal by one of the 2 radiologists. The remaining 188 chest radiographs were used for the inter-observer agreement assessment. Inter-observer agreement was fair (kappa 0.2-0.4) for specific radiographic findings. The highest kappa value was for determining the presence of pleural effusion (0.35), followed by the extent of pneumonia (0.27), whereas the lowest values (kappa 0.26) were for determining the main pattern of infiltrate and its location. No statistically significant differences were found ( $p > 0.05$ ) in the radiologic features among all the patients according to etiologic agents. Similarly, there were no differences between bacterial pneumonia alone or in coinfection and viral pneumonia. **Conclusions:** The presence of pleural effusion, the extent of pneumonia, its location and the main pattern of infiltrate show fair inter-observer agreement. No relation between different pathogens and specific radiological features was found.

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### RISK FACTORS FOR DEPRESSION IN ADOLESCENTS

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Adolescence is a critical period that presents significant changes in the biological, psychological and social development. This process makes feasible depressive and anxious manifestations of variable consequences. The importance in the recognition of factors of risk resides in the appropriate detection and opportune treatment. **Objective:** To determine the depression prevalence and to identify risk factors associated in a sample of adolescents from 15 to 19 years old. **Material and Method:** Observational, analytic, prospective and traverse study was carried out in adolescents of 15 to 19 years of age. A survey which explore demographic, socioeconomic, family educational level, additions in the adolescent and his family, family violence and personal image variables and the Self-Rating Depression Scale by William Zung were applied. **Results:** 1160 students, 58.3% female and 41.6% male were interviewed. The average age was 16.17  $\pm$  1 - 0.97 years old. A prevalence of 18.3% of probable depression was detected. Light depression was detected in 12.9%, 4.4% to moderate depression and 0.9% to serious cases. The average of risk factors was of 7.34  $\pm$  2.95. To count with 10 factors of risk increases 4 times more possibility to have depression with CI 95% (2.831 - 5.394) an confidence interval to 95% between 2.831 and 5.394. **Discussion:** Our results show that with an increment in number of risk factors there is greater emotional vulnerability. In real life, those factors behave in a dynamic way and together could improve its effect. Because of that, individual and grouped factors were distinguished; considering that in an isolated way they will not necessarily determine a depression. By detecting risk factors is feasible to infer a probable depression indirectly without the need of an expert evaluator, being of great utility in the educational and health sectors. **Conclusion:** The present study allowed to know the depression prevalence. Significant risk factors were identified and analyzed. Presence of at least 1 factor of risk of familiar violence was enough to make the probable depression diagnosis.

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### RISK FACTORS FOR CATHETER-ASSOCIATED BLOODSTREAM INFECTIONS IN PEDIATRIC INTENSIVE CARE UNIT (PICU) PATIENTS

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**Background:** Central venous catheters are often mandatory devices when caring for critically ill children. Bloodstream infections (BSIs) are the most frequent type of nosocomial infection in critically ill children, and >90% of BSIs occurs in children with central vascular catheters (CVCs). The rate of CVC – associated BSI is 6.6 infections per 1,000 catheter days. **Objective:** To determine the risk factors for catheter – associated bloodstream infection (CABS) in Pediatric Intensive Care Unit (PICU) patients. **Method:** Design: Prospective cohort study. **Settings:** This study was performed at PICU of Children's Health National Institute (Lima – Peru). **Patients:** PICU patients admitted between June 1, 2007, and May 31, 2008. **Interventions:** none. **Outcome measures:** CABS developed during PICU stay and up to 48 hours after discharge from it. **Results:** During the study period 183 patients were admitted, 99 (54%) male and 84 female. There were 24 cases of CABS, yielding a rate of 14.03 infections per 1,000 catheter days. *Candida* spp was the leading cause of CABS (11 isolations; 7 *albicans*, 4 sp), followed by Coagulase-negative *Staphylococcus* (8 isolations). After logistic regression analysis, patients with CABS were more likely to have multiple central vascular catheter (RR: 3.2; 95% confidence interval [CI], 1.1 - 9.2) and male gender (RR: 3.1; 95% CI, 1.3 - 7.7). **Conclusion:** This study identified a high rate of CABS among PICU patients of Children's Health National Institute. Male gender and multiple CVC (>1) were risk factors for CABS. The two most common pathogens isolated were *Candida* spp and Coagulase-negative *Staphylococcus*. A prospective study with more patients is needed to identify other risk factors.

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### EFFECTS OF THE INTRAUTERINE GROWTH RETARDATION ON POST-NATAL GROWTH OF RATS: INFLUENCE OF GH AND SEX HORMONES.

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The aim of this study was to analyze the responses to different treatments with specific hormones (growth hormone [GH] and sex hormones) on the postnatal growth of rats after intrauterine-growth retardation (IUGRn), taking into account alterations in skeletal size and bone maturation. Wistar Rats were divided into the following groups: Control, intrauterine growth retarded animals (IUGRd), IUGRd plus GH (IUGRd+GH), IUGRd castrated (IUGRd-CT), IUGRd castrated plus GH (IUGRd-CT+GH), IUGRd treated with testosterone (IUGRd+TT) and estradiol (IUGRd+ED). IUGR was induced by partial obstruction of the uterine arteries on day 14 of gestation. The animals were x-rayed at 1, 21, 42, 63, and 84 days of age and the following dimensions of their bones measured: the length, width, and height of the neuro- and splanchnocranium; the length of the vertebral column; the pelvic length and the upper, middle, and lower pelvic widths; and the lengths and the widths of the humerus, femur, and tibia. Bone maturation was evaluated longitudinally considering the thickness of the tibial cartilage. The data were analyzed by the Kolmogorov Smirnov test; analysis of variance; the multiple-range, minimal-significant-difference, and simple- and multiple-correlation tests; and principal-component analysis. The data on bone maturation were analyzed by the Chi<sup>2</sup> method and Spearman correlation. The analysis of variance showed significant differences for the parameters age, sex, and treatment in every variable measured ( $p < 0.01$ ). Multiple correlation showed a brooked-size effect in both sexes at the final age. The first axis of PCA encloses the variance of size and the second axis the variances of the shape-clustering treatments. The Chi<sup>2</sup> analysis indicated an alteration in maturity for the males (IUGRd-CT, IUGRd-CT+GH and IUGRd+TT;  $p < 0.01$ ) and the females (IUGRd+GH and IUGRd+ED;  $p < 0.01$ ). These results suggest that IUGRn modifies every variable measured in both sexes. The castration increases growth in females and inhibits neurocranial and splanchnocranial growth in males. TT stimulates growth in the long bones, while ED inhibits growth in every bone parameter, though both hormones do accelerate maturation. Males show incomplete catch-up of bone width in the absence of maturation effects, whereas females show both a comprehensive catch-up growth and an acceleration of maturation. In conclusion, males and females display dissimilar recovery strategies as a consequence of their differing adaptive processes.

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### SECULAR CHANGES IN THE BODY COMPOSITION OF CHILDREN IN THE CITY OF LA PLATA (ARGENTINA)

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Secular trend refers to modifications in growth and/or development produced in a given population over generations. **Objective:** To investigate the secular pattern in body composition in two samplings of children between 4 and 12 years of age, in La Plata City. The first sampling (1,790 children—898 boys and 892 girls; S1) was selected in 1970 from a random stratified survey of homes; the second (1,060 children—542 boys and 518 girls; S2) was obtained in 2005 in urban and suburban schools. In both studies the body measurements were made within 30 days of each child's birthday. We measured arm circumference (AC) and the tricipital (TsF) and subscapular (SsSF) subcutaneous folds and calculated the muscle (MA) and fat (FA) areas of the arm. **Results:** We found statistically significant (s.s.) increments in the TsF, SsSF, and FA at all ages. The average variations per decade were: TsF boys, 0.10  $\pm$  0.03 mm (10.4%) and girls, 0.10  $\pm$  0.02 mm (9.2%); SsSF boys, 0.70  $\pm$  0.39 mm (10.5%) and girls, 0.60  $\pm$  0.28 mm (7.7%); FA boys, 0.95  $\pm$  0.36 cm<sup>2</sup> (11.0%) and girls, 0.96  $\pm$  0.22 cm<sup>2</sup> (10.0%). By contrast, the AC exhibited a lesser increase, reaching s.s. values only at ages 5 and 9-11 years in boys and 4-8 and 11 years in girls. MA in the S2 were systematically lower than in the S1; with s.s. differences only at ages 6, 9, and 10 (boys) and 9 (girls). The percentage relationship between the fat and muscle areas of the arms obtained in the S1 sampling for both sexes were 30% and 70%, respectively; whereas in the S2 the corresponding values were 38% and 62% for the boys and 41% and 59% for the girls. **Conclusion:** The increase in brachial adiposity in the face of a relative stability of the muscle tissue detected in the S2 children relative to the S1s suggests the occurrence of modifications in the eating habits (an increase in caloric consumption) and in the physical activity (more time spent sedentary) in the former, more contemporary population than in the latter, monitored three decades ago.