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GH THERAPY IN CHILDREN WITH DISSOCIATED GH RELEASE (DGHR) DURING PROVOCATIVE TESTS (PT). L Cavallo *, F De Luca **, AM Pasquino***, T Arrigo**, F Calaciura^, M Distefano^, S Liuzzi*, E Paradiso***, C Zecchino*. Univ. di Bari*, Univ. di Messina**, Univ. La Sapienza, Roma***; Univ. di Catania^.

DGHR (1 peak>10 ng/ml and 1 peak<10ng/ml) during 2 different provocative tests (PT) is frequent in short children, generally not considered as classically GH-deficient (GHD). Since different provocative tests act via different mechanisms, this study aims to evaluate if this dissociation may reflect a persistent impairment of one pathway of GH stimulation. The study was performed in 12 short children, normal for gestational age, aged 4.2-10.3 y (median (M) 8.0 y), with a bone age delay (BAD) of 10.0-40.5% (M 24.6%). Height (H) and H velocity (HV) were -1.89/-3.90 SDS (M -2.62) and -0.74/-2.92 SDS (M -1.96) for chronological age (CA), respectively. GH peak was >10 ng/ml (10.1-20.3) at the clonidine test and <10 ng/ml (2.4-10.0) at 2 separate ITT (interval >3 months). Recombinant GH therapy (0.1 U/Kg/d sc 6 x / week) was administered for 1 y. Controls were 10 GHD with corresponding CA (5.7-8.9 y, M 6.2), BAD (3.6-49.2%, M 34.4%), H (-1.91/-2.93 SDS, M -2.59) and HV (-0.06 /-3.50 SDS, M -1.81) treated with the same protocol. H and HV significantly increased after both 6 and 12 m of GH therapy ($p<0.02$) without any significant change in BA/CA ratio ( Wilcoxon and Mann-Whitney tests). No significant differences were found with respect to GHD patients. Reduced GH release after a single PT may indicate impairment of a specific mechanism of GH secretion (selective GH deficiency) and consequently may be treated with GH therapy.

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GROWTH HORMONE TREATMENT AND SHBG LEVELS IN TURNER SYNDROME

G. Municchi, A.M. Pasquino, D. Larizza, R. Balducci, F. Passeri, I. Pucarelli, V. Toscano. Depts. of Pediatrics, University "La Sapienza", II University of Rome and University of Pavia; Endocrine Dept. University "La Sapienza" of Rome, Italy. (Spn. by Claudio Chiesa)

Sex steroids are involved in regulating Sex Hormone Binding Globulin (SHBG) levels. In addition, thyroid hormones, growth hormone (GH) and nutritional status may affect SHBG levels. The GH role on this regulation is still unknown ; it has been reported that hGH treatment decreases SHBG levels in GH deficient prepubertal children, probably via insulin-like growth factor-I (IGF-I). To evaluate the effect of hGH therapy on SHBG without the interference of gonadal sex steroids, we studied 23 euthyroid prepubertal Turner patients before and during hGH therapy. Their chronological age (mean ± SD) was 9.5 ± 2.8 yr, bone age 7.7 ± 2.5. Just 2 patients showed a deficient GH response to pharmacological stimuli (peak <7 mcg/L). hGH was given at 1 IU/kg/week sc divided into 6 weekly doses . No patient was treated with estrogens . SHBG, IGF-I, testosterone (T), estradiol (E2), TJ, T4 and TSH were evaluated before and 13.6 ± 5.3 mo after start of hGH therapy. In all patients SHBG levels did not significantly change on treatment (52.8 ± 10.2 vs 49.4 ± 6.9 nmol/L); IGF-I increased significantly from 81.9 ± 13 to 184.2 ± 36.8 ng/ml ($p< 0.05$). Thyroid hormones, E2 and T remained unchanged. No variation was observed in Body Mass Index (BMI) (18.5 ± 0.8 vs 18.7 ± 0.7). In conclusion, in spite of a significant increase of IGF-I levels, hGH therapy, at least at the high dose used, does not seem to exert any influence on SHBG levels in Turner patients.

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**SECRETION PROFILES OF THE MAJOR FLUID AND ELECTROLYTE REGULATORY HORMONES FOLLOWING SEVERE THERMAL INJURY.**

A.Smith, M. Ritchie, R. Stephen, M. Thomson, A. Heywood, A. Watson*, A. Quaba*, N. McIntosh. Depts. of Child Life and Health and Paediatric Surgery*, Edinburgh University.

Little is known about the changes in the secretion patterns of the major fluid and electrolyte regulatory hormones following severe thermal injury in children. Resuscitation protocols are based mainly on data derived from studies in adults. The aim of our study was to investigate the changes in secretion of the major fluid controlling factors, vasopressin, (AVP), atrial natriuretic peptide (ANP), angiotensin (AII), plasma renin (PRA), aldosterone (ALD) and the catecholamines ( NOR, ADR, DA) in children with severe burn injuries.

**Methods**: 7 children, 0.6 - 4.8 yr (median 1.9 yr) admitted to the Plastic Surgical Unit of the Royal Hospital for Sick Children, Edinburgh, with severe thermal injuries, 12 - 61 %body surface area (median 21%), were evaluated over the first 4 days following injury. An extra 1.5ml of blood for hormone determinations was obtained whenever a sample was taken for clinical evaluations.

**Results**: As data was not normally distributed, geometric mean hormone levels were calculated. Values are given in pg/ml (peptides), pmol/ml/hr (PRA) and pmol/ml (CATS)

| TIME(hr) | AVP | ANP | ANGII | PRA | ALD | NOR | ADR | DA |
|---|---|---|---|---|---|---|---|---|
| 0 | 75 | 25 | 687 | 29 | 1247 | 2.21 | 3.15 | 0.92 |
| 1-6 | 25 | 20 | 565 | 20 | 1344 | 1.20 | 3.4 | 1.25 |
| 7-12 | 16 | 27 | 334 | 18 | 1290 | 1.97 | 1.08 | 0.33 |
| 13-18 | 6 | 34 | 263 | 17 | 1043 | 1.27 | 1.15 | 0.33 |
| 19-24 | 6 | 37 | 304 | 17 | 1265 | 0.86 | 0.67 | 0.37 |
| 25-36 | 3 | 52 | 208 | 10 | 985 | 1.19 | 1.12 | 0.57 |
| 37-48 | 4 | 44 | 241 | 9 | 618 | 1.05 | 0.49 | 1.03 |
| 49-60 | 4 | 83 | 237 | 7 | 324 | 1.28 | 0.65 | 2.40 |
| 61-84 | 2 | 158 | 88 | 5 | 595 | 0.89 | 0.89 | 0.64 |
| 85-108 | 3 | 117 | 232 | 6 | 178 | 0.65 | 1.25 | 0.52 |

**Conclusions:** We believe that these are the first reported data showing secretion profiles of the major fluid and electrolyte regulating factors in burn injured children.

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**IS FLUID HOMEOSTASIS FOLLOWING THERMAL INJURY RELATED TO BURN SURFACE AREA (BSA).** A. Smith, M. Ritchie, M. Thomson, A.Heywood * A. Watson*, A. Quaba*, N. McIntosh. Depts. of Child Life & Health and Paediatric Surgery*, Edinburgh University, UK.

Disorganisation of fluid balance is common following thermal injury, with fluid shifts between intra and extracellular compartments and fluid losses being recognised contributors. We therefore wished to examine whether the extent of the thermal injury would be related to the derangement. As measurement of fluid losses from the skin and movement between compartments is clinically difficult, we initially evaluated the hormonal response to the injury.

**Methods**: 25 children, 0.12- 10.83yr (median 2.25yr) admitted to the Plastic Surgical Unit of the Royal Hospital for Sick Children, Edinburgh, were evaluated on admission, 0.25-14.5hr (median 2.25hr) after injury. The BSA was measured using standard methodology. An additional 1.5ml of blood was taken with the admission blood sample for the measurement of the major fluid and electrolyte regulatory hormones by radioimmunoassay.

**Results**: Highly significant correlations were found between plasma hormone concentrations in admission samples and %BSA.

| | r | p |
|---|---|---|
| arg vasopressin | 0.86 | 0.0001 |
| atrial natriuretic peptide | -0.49 | 0.0130 |
| plasma renin activity | 0.90 | 0.0001 |
| angiotensin II | 0.79 | 0.0001 |
| aldosterone | 0.68 | 0.0004 |

**Conclusions**: We believe this is the first reported data showing that plasma concentrations of the major fluid and electrolyte regulatory hormones are related to the size of thermal injury in children.

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ENDOTOXIN ALTERS DEXTROSE INDUCED INSULIN SECRETION IN SUCKLING RATS. W. Patrick Zeller, Masakatsu Goto, Michael E. Gottschalk, Craig L. Anderson and Cecilia Hofmann. (Spn. by A. Wilkinson) Loyola University Chicago, Depts. of Paediatrics & Physiology, Maywood, IL, USA.

To better understand the molecular mechanisms of decreased insulin secretion during endotoxic shock, isolated pancreatic islets from 10 day old rats were studied Pancreatic islets were isolated 4 hours after an ip injection of saline or endotoxin (LPS; 0.1mg/kg; LD90 at 24 hours). Glucose transporter GLUT1 and 2 mRNA abundance in isolated islets were determined by Northern blots, and morphologic changes of islets were observed. Five islets were incubated for 60 minutes in 10 ml of RPMI media with dextrose (500mg/ml) to determine insulin release (pM). Abundance of glucose transporter isoform in LPS treated group was expressed as percent of saline treated controls.

| Rat + Saline (n=5) | | | Rat + LPS(n=4)($\bar{x}$±SEM*p<.001) | | |
|---|---|---|---|---|---|
| Insulin | GLUT1 | GLUT2 | Insulin | GLUT1 | GLUT2 |
| 90±12 | 100% | 100% | 48±6* | 382±85%* | 48±13%* |

LPS did not alter islet anatomy. Insulin response to dextrose was decreased in the LPS treated group. The abundance of mRNA for GLUT1 was increased and GLUT2 decreased, thus showing divergent regulation of the two transporter isoforms. Altered glucose transporter gene expression in pancreatic islets may help explain decreased insulin release in the young rat with endotoxic shock.

# EPIDEMIOLOGY

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A COMPREHENSIVE ASSESSMENT OF THE HEALTH STATUS OF EXTREMELY LOW BIRTHWEIGHT CHILDREN (<1000G BW) AND CONTROLS AT 8 YEARS OF AGE. Saroj Saigal, Peter L Rosenbaum, William J Furlong, David H Feeny, George W Torrance, Departments of Pediatrics & Clinical Epidemiology & Biostatistics, McMaster University, Children's Hospital at Chedoke-McMaster, Hamilton, Ontario, Canada. Sponsored by John C. Sinclair.

A Multi-attribute health status (MAHS) classification system developed in our institution was applied to clinical and psychometric data collected prospectively at age 8 years on 156/179 ELBW and 145 matched term controls (C) born between 1977 and 1982. The MAHS system describes both the type and severity of functional limitations according to 7 attributes - sensation, mobility, emotion, cognition, self-care, pain and fertility (not applicable here), with 4 or 5 levels of function within each attribute. Each unique combination of levels represents a different health state. Using this approach, 14% of ELBW subjects had no functional limitations, 58% had reduced function for 1 or 2 attributes, and 28% had ≥ 3 attributes affected. The corresponding figures for controls were 50%, 48% and 2% ($p<.0001$, $=.08$,$<.0001$). Notably, the limitations in the ELBW group were in cognition 58%, sensation 48%, mobility 21% and self-care 17%, compared with 28%, 11%, 1%, and 0% for controls (all $p<.0001$). In general, the limitations were more severe and complex in ELBW children. These results provide a comprehensive description of the health status of ELBW children along several dimensions. The MAHS classification approach is useful to compare the health status of different populations and within groups across time and space. In addition, a utility-function can be applied to the MAHS system to quantify health-related quality of life.