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Introduction: Oral glucose tolerance test (OGTT) allows classification of subjects in 3 groups, depending on glycaemia 120 minutes after 75g glucose ingestion: normal (glycaemia < 1.4 g/L), glucose intolerant (1.4-2 g/L) and diabetic (>2g/L). Five insulin profiles following OGTT associated with different incidence rates of diabetes over 10 years of follow-up have also previously been described (Kraft J et al, *Laboratory Medicine,* 1975; Hayashi T et al, Diabetes Care.2013). Insulin measurement is very sensible to hemolysis and can advantageously be replaced by C-peptide determination. However, little is known about C-peptide reference values and response to OGTT.**Material and Methods:** 128 patients were included to evaluate glyceamia (COBASe801® ROCHE Diagnostics, France), insulin and C-peptide (LiaisonXL®, Diasorin, France) responses to OGTT.**Results:** According to Hayashi classification, 23 (18%) patients of the whole cohort harbored a physiological insulin response corresponding to profile I (peak of insulin during OGTT at 30 min and higher insulin level at 60 vs. 120 min). Others presented 5 pathological profiles: 14 (11%) patients were classified in profile II (peak of insulin at 30 min and lower or equal insulin level at 60 vs. 120 min), 56 (44%) in profile III (peak of insulin at 60 min), 26 (20%) in profile IV (peak of insulin at 120 min and lower insulin level at 30 vs. 60 min), and finally 9 (7%) in profile V (peak of insulin at 120 min and higher or equal insulin level at 30 vs. 60 min). Only 4 different mean C-peptide profiles emerged from the subgroups previously defined by insulin profile, mean C-peptide profile being substantially similar to mean insulin profile. The only major difference relied on a similar C-peptide profile corresponding to a growing curve from T0 to T120 in both patients with insulin profile IV and V. Mean and 95% confidence interval of C-peptide value at the different times of OGTT were also calculated in the subgroup of patients with both normal glycemic and insulin (pattern I) responses to propose reference values: respectively T0: 0.53 (0.26-0.77); T30: 2.2 (1.24-3.29); T60: 2.26 (1.36-3.68); T120: 1.88 (0.84-2.62) nmol/L. **Conclusion:** C-peptide response to OGTT profile seems to give globally the same information as insulin profile and should therefore also be predictive of the risk type 2 diabetes in case of hemolyzed samples. The slight differences observed between insulin and C-peptide profiles can be explained by their different metabolic pathways, insulin being quickly degraded in the liver and C-peptide undergoing a longer renal elimination. This work also allows us to propose for the first-time reference values for C-peptide at the different times of OGTT using Liaison XL®.

Pediatric Endocrinology

PEDIATRIC PUBERTY, TRANSGENDER HEALTH, AND GENERAL ENDOCRINE

Do Low Sex Hormone Binding Globulin Levels in Newborns Predict Weight Gain in Infancy and Early Childhood?

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Background: SHBG levels are low in obesity, and low SHBG levels are a biomarker for the development of T2DM and the metabolic syndrome. We sought to determine whether low SHBG in newborns will predict childhood obesity. **Methods:** We studied 94 healthy, singleton, full-term newborns, and measured their length, weight (BW), waist circumference, and skinfold thicknesses. We collected cord blood as well as day 2 venous blood samples for the measurement of SHBG and insulin (ALPCO, Salem NH). Maternal age, pre-pregnancy weight, pregnancy weight gain, and glucose screening test results were obtained from obstetrical records. Mothers with chronic diseases were excluded from the study. When babies were 2 years old, we administered a questionnaire to collect information about their eating, sleeping, screen viewing habits, and anthropometric measurements at ages 6, 12, and 24 months (n=47). Overweight was defined as a BMI SDS of ≥1 and <2.0, and obesity as ≥2 SDS. We used the Shapiro-Wilk test to determine if variables were normally distributed. Data were analyzed using the Mann Whitney U and Wilcoxon signed-rank tests, and by Pearson or Spearman correlation analyses. We report non-normally distributed variables as medians and interquartile ranges (IQR). Because of skewed distributions, log 10 transformed values for SHBG were used in the regression analyses. **Results:** SHBG levels on day 2 were significantly higher than in cord blood [22.0(28.7-16.9) vs. 19.0(24.6-14.5) nmol/L, p<0.001], whereas insulin levels were higher in cord blood than in day 2 samples [3.2(5.3-2.0) vs. 1.5(2.2-0.8) μIU/mL, p<0.001]. SHBG and insulin levels were similar in male (n=44) and female (n=50) babies at all time points. Babies with Ponderal index values in the highest quartile had lower day 2 SHBG [18.2(22.1-16.7) vs. 24.3(30.3-18.2) nmol/L, p=0.02] and higher cord blood insulin levels [5.0(7.4-2.6) vs. 2.9(4.8-1.5) μIU/mL, p=0.04] than the remainder of the cohort. At age 2 years, 32% (15/47) of babies were overweight or obese, 60% (28/47) were breastfeeding, 58% (27/47) were watching TV or iPads, and 55% (26/47) were eating sweet snacks. Toddlers watching TV or iPads (p=0.008), or eating sweet snacks (p=0.04) were heavier than their peers. Neither cord blood nor day 2 SHBG or insulin levels correlated significantly with any of the anthropometric measurements in the newborns. On the other hand, day 2 SHBG levels correlated positively with weight at 6 (r=0.311, p=0.04) and 24 months (r=0.353, p=0.02) of age. These associations remained significant after adjusting for gender, BW, gestational age, breastfeeding status and fruit juice intake at 6 months (R^2=0.28, p=0.048) and for gender, BW, gestational age, breastfeeding status, sweet snack intake and screen viewing habits at 24 months (R^2=0.33, p=0.046). **Conclusion:** Although the heaviest babies had lower SHBG levels at birth, low SHBG did not predict overweight at age 2 years.

Adrenal

ADRENAL - CORTISOL EXCESS AND DEFICIENCIES

Structural Instability as an Underlying Pathomechanism in Congenital Adrenal Hyperplasia

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