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## Abstracts

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association of TG/HDL-C ratio with the high triglycerides and low HDL-C, but not with glucose serum level, blood pressure and WC.

**Conclusion:** We have shown that a very simple index, which just need the evaluation of triglycerides and HDL-c serum levels, has the same accuracy of other more sophisticated indexes in recognizing MetS in children and adolescents with severe obesity.

#### P1-273

### An adult-based genetic risk score for hepatic fat associates with liver and lipid traits in Danish children

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**Background and Aim:** Several genetic variants associating with hepatic fat content in adults have been identified in genome-wide association studies. Their effects in children remain unclear. This study aimed to test the effect of genetic variants known to associate with hepatic fat in adults, individually and combined as a genetic risk score (GRS), on cardiometabolic traits, and to investigate the predictive ability of the GRS for hepatic steatosis in children.

**Methods:** Children with overweight/obesity from an obesity clinic cohort (n = 1,843, median age 11.7 years, body mass index standard deviation score [BMI SDS] 2.85, 45.2% male) and a population-based cohort (n = 2,271, median age 11.6 years, BMI SDS 0.26, 40.1% male) were included. Anthropometrics and biochemical parameters were measured in both cohorts. Liver fat content (LFC) was measured by magnetic resonance spectroscopy in 539 individuals. We calculated a weighted GRS based on eight genetic variants known to associate with hepatic fat content in adults. Associations of individual genetic variants and the GRS with cardiometabolic traits were tested using multiple linear and logistic regression models. Receiver operating characteristic (ROC) curve analysis was performed on models based on risk factors for hepatic

steatosis, defined as hepatic fat  $\geq 5\%$ , and area under the curve (AUC) was calculated to evaluate model performance.

**Results:** Variants in *PNPLA3*, *TM6SF2*, *GPAM*, and *GCKR* were significantly associated with higher LFC ( $p < 0.01$ ) and with distinct patterns of circulating lipids. The GRS was associated with higher LFC and alanine transaminase (ALT), as well as lower LDL-cholesterol and triglycerides in both cohorts. The GRS was not associated with adiposity or other metabolic traits. The GRS was associated with higher prevalence of hepatic steatosis (odds ratio [OR] per 1-unit GRS-increase: 2.18,  $p = 1E-8$ ), and with lower prevalence of dyslipidaemia (OR 0.90,  $p = 0.02$ ). A prediction model for hepatic steatosis including GRS alone, yielded cross-validated AUC of 0.76 (95% CI 0.69-0.83). The addition of the GRS to a model containing clinical risk factors for hepatic steatosis (BMI SDS, ALT, homeostatic model assessment of insulin resistance [HOMA-IR]) increased AUC slightly from 0.87 (95% CI 0.82-0.92) to 0.89 (95% CI 0.84-0.94).

**Conclusion:** The adult-based GRS for hepatic fat associated with LFC, liver enzymes, and lipid profiles, but was not associated with adiposity and other metabolic traits in children. The GRS could serve as a clinical risk predictor of hepatic steatosis and be used in early prevention.

#### P1-274

### Thyroid function in overweight and obese children and adolescents

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**Background:** Obesity in childhood and adolescence represents one of the most challenging public health problems of our century. The prevalence of overweight and obesity in Greece is approximately 21% in children younger than 6 years and up to 40% in older children and adolescents. Mild elevations of TSH concentrations are often detected in obese children and adolescents.

**Aim:** To investigate the thyroid function in overweight and obese children and adolescents.

**Methodology:** We studied three thousand and ten (n=3,010) children and adolescents aged 2-18 years (mean age  $\pm$  SD: 10.236  $\pm$  3.011 years) attending our 'Out-patient Clinic for the Prevention and Management of Overweight and Obesity in Childhood and Adolescence'. Subjects were classified as obese (n= 1,710; 56.8%), overweight (n=834, 27.7%) or as having normal body mass index (BMI) (n=466, 15.5%) according to the International Obesity Task Force cutoff points. All subjects were evaluated by a multidisciplinary team at frequent intervals, and received personalized guidance on diet and exercise. Detailed clinical evaluation and laboratory investigations were performed at each clinic visit.

**Results:** Obese subjects had significantly higher systolic and diastolic blood pressure, as well as significantly higher concentrations of fasting plasma glucose and serum insulin, HbA1C, triglycerides, LDL-cholesterol, uric acid and ApoB, and significantly lower concentrations of HDL-cholesterol, ApoA1 and Vitamin D than their overweight and normal-BMI counterparts. Furthermore, obese children and adolescents had significantly higher TSH (mean  $\pm$  SD:  $2.9 \pm 1.4$  mIU/L,  $p < 0.005$ ) and T3 (mean  $\pm$  SD:  $146.5 \pm 31.4$  ng/dL,  $p < 0.001$ ) concentrations compared with overweight and normal-BMI subjects. An increase in age by one year was associated with a decrease in FT4 concentrations by  $0.007$  ng/dL (95%CI,  $-0.007, -0.009, -0.003$ ), in T3 concentrations by  $3.847$  ng/dL (95%CI,  $-3.847, -4.484, -3.210$ ) and in TSH concentrations by  $0.051$  mIU/L (95%CI,  $-0.051, -0.083, -0.019$ ) when all other variables remained constant. Compared with normal-BMI subjects, overweight subjects demonstrated an increase in T3 concentrations by  $5.9$  units (95%CI,  $5.905, 1.986, 9.825$ ), while obese subjects had an increase in T3 concentrations by  $9.9$  units (95%CI,  $9.874, 6.007, 13.741$ ) when all other variables remain constant.

**Conclusions:** Impaired thyroid function may be often seen in children and adolescents with overweight and obesity, and may change following weight loss. Further studies are required to investigate the possible association of thyroid hormones with cardiovascular risk factors in obese and overweight children and adolescents.

#### P1-275

### Cardio-metabolic health in Danish children aged 7-10 years conceived after assisted reproductive technology

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**Background:** Children conceived after assisted reproductive technology (ART) with frozen embryo transfer (FET) are more often born large-for-gestational age (LGA) while children born after fresh embryo transfer (fresh-ET) are at risk of being small-for-gestational age (SGA).

LGA or SGA children are at increased risk of obesity, diabetes and cardiovascular disease later in life. The long-term cardio-metabolic health of children born after ART is scarcely explored.

**Materials and Method:** The cross-sectional cohort study “Health in Childhood following Assisted Reproductive Technology” (HiCART) includes 606 singletons (292 boys): 200 conceived after FET; 203 conceived after fresh-ET; and 203 naturally conceived (NC) children matched for birth year and sex. They were examined at 7-10 years of age including anthropometric measurements, whole-body dual-energy x-ray absorptiometry (DXA), pubertal staging (Tanner), blood pressure (BP) and a fasting blood sample. Anthropometrics and BP were converted to standard deviation scores (SDS).

**Results:** In the following the three groups were compared pairwise and data shown in mean (SD). Children conceived after FET had significantly higher birth weight (SDS) (0.20 SDS (1.09)) and children conceived after fresh-ET had lower birth weight (SDS) (-0.22 SDS (1.00)) compared to NC children (-0.16 SDS (1.09)).

Pubertal onset in 54 girls (17%) and three boys (1%) was evenly distributed among the groups.

No differences in height (SDS), weight (SDS) or BMI (SDS) was found between the groups. A more thorough investigation of body composition showed no differences between the groups regarding waist-to-height ratio (FET: 0.44 (0.04), fresh-ET: 0.43 (0.03), NC 0.44 (0.04)) and fat percentage (DXA) (FET: 28.2% (6.77), fresh-ET: 28.1% (6.50), NC: 28.2% (6.24)).

Glucose metabolism was similar in the groups including fasting glucose, C-peptide, HbA1c and insulin resistance (HOMA-IR). Lipid profiles including cholesterol, low-density-lipoprotein and high-density-lipoprotein were also similar.

No differences were seen in diastolic BP (SDS) between the groups (FET: 0.46 SDS (0.56), fresh-ET: 0.39 SDS (0.58), NC: 0.49 SDS (0.57)) but surprisingly systolic BP (SDS) was slightly lower in the fresh-ET-group (0.53 SDS (0.67)) compared to both FET (0.70 SDS (0.86 SD)),  $p = 0.03$  and NC (0.71 SDS, (0.68)),  $p = 0.01$ .

**Conclusion:** The differences in birth weight in children conceived after FET and fresh-ET was as expected but did not translate into differences in anthropometrics, glucose- or lipid profile in childhood. Systolic BP was not increased after FET nor fresh-ET. These findings are reassuring and may add to the knowledge about the safety and long-term consequences of FET and ART in general.