Hormone Research
in Paediatrics

60th Annual Meeting of the European Society for Paediatric Endocrinology (ESPE)

Rome, Italy, September 15–17, 2022

Abstracts

Karger

P1-271

Serum Osteopontin, NGAL and Sclerostin concentrations in children and adolescents with overweight and obesity

Sofia-Iliada Karampatsou[1], *George Paltoglou*[1], *Sofia-Maria Genitsaridi*[1], *Penio Kassari*[1], *Evangelia Charmandari*[1,2]

[1]Division of Endocrinology, Metabolism and Diabetes, First Department of Pediatrics, National and Kapodistrian University of Athens Medical School, 'Aghia Sophia' Children's Hospital, Athens, Greece. [2]Division of Endocrinology and Metabolism, Center of Clinical, Experimental Surgery and Translational Research, Biomedical Research Foundation of the Academy of Athens, Athens, Greece

Background: Obesity in childhood and adolescence represents a major health problem and is associated with significant morbidity and mortality in adult life. Osteopontin, NGAL and Sclerostin are bone biomarkers, however, little is known about their role in obesity.

Objective and Hypothesis: The aim of our study was to determine the concentrations of Osteopontin, NGAL and Sclerostin in children and adolescents with overweight and obesity.

Methods: The study sample consisted of 345 subjects aged 2-18 years (mean age ± SD: 10.36 ± 0.16 years; 172 males, 173 females; 181 prepubertal, 164 pubertal). Subjects were classified as obese (63.8%) and overweight (36.2%) and were enrolled in a personalized, life-style intervention program of diet and physical exercise for at least one year. Body composition and biochemical and endocrinologic parameters were determined at the beginning and at the end of the study. The study was approved by the Committee on the Ethics of Human Research, and written informed consent was obtained by all parents.

Results: Following one year of the intervention program, there was a significant decrease in BMI ($p<0.01$), BMI z-score ($p<0.01$), DBP ($p<0.01$), Waist-to-hip Ratio (WHR) ($p<0.01$), Waist-to-Height Ratio (WHtR) ($p<0.01$), AST ($p<0.01$), ALT ($p<0.01$), γGT ($p<0.01$), total cholesterol ($p<0.01$), LDL ($p<0.01$), Apo-B ($p<0.01$), Osteopontin ($p<0.01$) and NGAL ($p<0.01$) concentrations, and percentage of fat mass ($p<0.01$) and an increase in HDL ($p<0.01$), Vitamin D ($p<0.01$), PTH ($p<0.01$), Lp(a) ($p<0.01$) and Sclerostin ($p<0.01$) concentrations, as well as percentage of muscle mass ($p<0.01$), bone mass ($p<0.01$) and free-fat mass ($p<0.01$).

Osteopontin concentrations correlated positively with PTH ($b=0.26$, $p<0.05$) and vitamin D ($b=0.294$, $p<0.05$) concentrations in overweight subjects, with Ca concentrations ($b=0.275$, $p<0.05$) in obese subjects, and with glucose concentration ($b=0.366$, $p<0.05$) in all subjects. NGAL concentrations correlated positively with WHR ($b=0.439$, $p<0.05$) and HOMA-IR ($b=0.4$, $p<0.05$) in overweight subjects and with HbA1c in obese subjects ($b=0.326$, $p<0.05$).

The change of NGAL concentrations correlated negatively with the BMI z-score ($b=-0.494$, $p<0.05$) in overweight subjects, with cholesterol ($b=-0.271$, $p<0.05$) in obese subjects and with HbA1c ($b=-0.304$, $p<0.05$) in all subjects. The change of sclerostin concentration correlated positively with insulin concentrations ($b=0.46$, $p<0.05$) in overweight subjects, and glucose concentrations ($b=0.315$, $p<0.05$) and HOMA-IR ($b=0.3$, $p<0.05$) in all subjects.

Conclusion: These findings indicate an association of Osteopontin, NGAL and Sclerostin with overweight/obesity, cardiovascular risk factors and glucose metabolism. Further studies are required to determine the underlying mechanisms responsible for the above associations.

P1-272

High Triglyceride/HDL ratio suggests a higher risk of metabolic syndrome among children and adolescents with severe obesity

Giorgio Radetti[1], *Antonio Fanolla*[2], *Graziano Grugni*[3], *Fiorenzo Lupi*[4], *Diana Caroli*[3], *Adele Bondesan*[3], *Alessandro Sartorio*[3]

[1]Marienklinik, Bolzano, Italy. [2]Observatory for Health Provincial Government South Tyrol, Bolzano, Italy. [3]Istituto Auxologico Italiano, IRCCS, Verbania, Italy. [4]Regional Hospital of Bolzano, Bolzano, Italy

Aim: Few data are currently available on the reliability of the different anthropometric, instrumental and biochemical indexes in recognizing the presence of the metabolic syndrome (MetS) in severe childhood obesity. The objective of our study was to find out a simple and accurate index to use in deciding whether to initiate a search for MetS in this at-risk population.

Patients and Methods: A retrospective study based on 1065 children and adolescents with severe obesity [563 females, aged 14.6±2.1 (range 10-17) years, and BMI-SDS 3.50±0.36 (range 3.00-5.17)], was performed. For each subject, all the components of MetS, defined according to the IDF criteria, were determined. The following indexes were calculated according to the following formulas: (a). BMI: weight (kg)/height (m2); (b). BMI-SDS: (BMI-mean BMI (for age and sex))/SD; (c) TMI: mass (kg)/height (m3): (d) WtHR: WC (cm)/height (cm); (e) TG/HDL-C ratio: TG (mmol/L)/HDL-C (mmol/L); (f) CMI: WtHR x TG/HDL-C ratio; (g) VAI: males: (WC/39.68+(1.88 x BMI)) x (TG/1.03) x (1.31/HDL): females: (WC/36.58+(1.89 x BMI)) x (TG/0.81) x (1.52/HDL). Median values were tested for statistical significance using 2-tailed Wilcoxon test and nonparametric one-way ANOVA. Spearman correlation coefficients were calculated to assess the relationship between indexes and metabolic characteristics. Adjusted receiver operating characteristic (ROC) analysis using clinical cut points for metabolic risks was performed to determinate the odds ratio of cardiometabolic risk factors across indexes. In addition, positive likelihood ratio (PLR), negative likelihood ratio (NLR), positive predictive value (PPV), and negative predictive value (NPV) were examined.

Results: Overall, the presence of MetS was found in 324 patients (30.4%), 167 males (33.3%) and 157 females (27.9%). We found that three indexes (i.e. VAI, CMI and TG/HDL-C ratio), performed significantly better than the other ones in identifying MetS, with no difference among them. Consequently, we choose the TG/HDL-C ratio as the simplest index. TG/HDL-C ratio showed a strong correlation with the clinical and biochemical parameters of MetS, but not with glucose levels. The odds ratio showed a strong