The Valuable Triad of Adipokine Indices to Differentiate Pediatric Obesity from Metabolic Syndrome: Chemerin, Progranulin, Vaspin

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Abstract : Obesity is associated with cardiovascular disease risk factors and metabolic syndrome (MetS). In this study, associations between adipokines and adipokine as well as obesity indices were evaluated. Plasma adipokine levels may exhibit variations according to body adipose tissue mass. Besides, upon consideration of obesity as an inflammatory disease, adipokines may play some roles in this process. The ratios of proinflammatory adipokines to adiponectin may act as highly sensitive indicators of body adipokine status. The aim of the study is to present some adipokine indices, which are thought to be helpful for the evaluation of childhood obesity and also to determine the best discriminators in the diagnosis of MetS. 80 prepubertal children (aged between 6-9.5 years) included in the study were divided into three groups; 30 children with normal weight (NW), 25 morbid obese (MO) children and 25 MO children with MetS. Physical examinations were performed. Written informed consent forms were obtained from the parents. The study protocol was approved by Ethics Committee of Namik Kemal University Medical Faculty. Anthropometric measurements, such as weight, height, waist circumference (C), hip C, head C, neck C were recorded. Values for body mass index (BMI), diagnostic obesity notation model assessment Index-II (D2 index) as well as waist-to-hip, head-to-neck ratios were calculated. Adiponectin, resistin, leptin, chemerin, vaspin, progranulin assays were performed by ELISA. Adipokine-to-adiponectin ratios were obtained. SPSS Version 20 was used for the evaluation of data. p values $\le$ 0.05 were accepted as statistically significant. Values of BMI and D2 index, waist-to-hip, head-to-neck ratios did not differ between MO and MetS groups (p $\ge$ 0.05). Except progranulin (p $\le$ 0.01), similar patterns were observed for plasma levels of each adipokine. There was not any difference in vaspin as well as resistin levels between NW and MO groups. Significantly increased leptin-to-adiponectin, chemerin-to-adiponectin and vaspin-to-adiponectin values were noted in MO in comparison with those of NW. The most valuable adipokine index was progranulin-to-adiponectin (p $\le$ 0.01). This index was strongly correlated with vaspin-to-adiponectin ratio in all groups (p $\le$ 0.05). There was no correlation between vaspin-to-adiponectin and chemerin-to--adiponectin in NW group. However, a correlation existed in MO group (r = 0.486; p $\le$ 0.05). Much stronger correlation (r = 0.609; p $\le$ 0.01) was observed in MetS group between these two adipokine indices. No correlations were detected between vaspin and progranulin as well as vaspin and chemerin levels. Correlation analyses showed a unique profile confined to MetS children. Adiponectin was found to be correlated with waist-to-hip (r = -0.435; p $\le$ 0.05) as well as head-to-neck (r = 0.541; p $\le$ 0.05) ratios only in MetS children. In this study, it has been investigated if adipokine indices have priority over adipokine levels. In conclusion, vaspin-to-adiponectin, progranulin-to-adiponectin, chemerin-to-adiponectin along with waist-to-hip and head-to-neck ratios were the optimal combinations. Adiponectin, waist-to-hip, head-to-neck, vaspin-to-adiponectin, chemerin-to-adiponectin ratios had appropriate discriminatory capability for MetS children.

Keywords : adipokine indices, metabolic syndrome, obesity indices, pediatric obesity