

Eosinophils and Platelets: Players of the Game in Morbid Obese Boys with Metabolic Syndrome

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Abstract : Childhood obesity, which may lead to increased risk for heart diseases in children as well as adults, is one of the most important health problems throughout the world. Prevalences of morbid obesity and metabolic syndrome (MetS) are being increased during childhood age group. MetS is a cluster of metabolic and vascular abnormalities including hypercoagulability and an increased risk of cardiovascular diseases (CVDs). There are also some relations between some components of MetS and leukocytes. The aim of this study is to investigate complete blood cell count parameters that differ between morbidly obese boys and girls with MetS diagnosis. A total of 117 morbid obese children with MetS consulted to Department of Pediatrics in Faculty of Medicine Hospital at Namik Kemal University were included into the scope of the study. The study population was classified based upon their genders (60 girls and 57 boys). Their heights and weights were measured and body mass index (BMI) values were calculated. WHO BMI-for age and sex percentiles were used. The values above 99 percentile were defined as morbid obesity. Anthropometric measurements were performed. Waist-to-hip and head-to-neck ratios as well as homeostatic model assessment of insulin resistance (HOMA-IR) were calculated. Components of MetS (central obesity, glucose intolerance, high blood pressure, high triacylglycerol levels, low levels of high density lipoprotein cholesterol) were determined. Hematological variables were measured. Statistical analyses were performed using SPSS. The degree for statistical significance was $p \leq 0.05$. There was no statistically significant difference between the ages (11.2 ± 2.6 years vs 11.2 ± 3.0 years) and BMIs (28.6 ± 5.2 kg/m² vs 29.3 ± 5.2 kg/m²) of boys and girls ($p \geq 0.05$), respectively. Significantly increased waist-to-hip ratios were obtained for boys (0.94 ± 0.08 vs 0.91 ± 0.06 ; $p=0.023$). Significantly elevated values of hemoglobin (13.55 ± 0.98 vs 13.06 ± 0.82 ; $p=0.004$), mean corpuscular hemoglobin concentration (33.79 ± 0.91 vs 33.21 ± 1.14 ; $p=0.003$), eosinophils (0.300 ± 0.253 vs 0.196 ± 0.197 ; $p=0.014$), and platelet (347.1 ± 81.7 vs 319.0 ± 65.9 ; $p=0.042$) were detected for boys. There was no statistically significant difference between the groups in terms of neutrophil/lymphocyte ratios as well as HOMA-IR values ($p \geq 0.05$). Statistically significant gender-based differences were found for hemoglobin as well as mean corpuscular hemoglobin concentration and hence, separate reference intervals for two genders should be considered for these parameters. Eosinophils may contribute to the development of thrombus in acute coronary syndrome. Eosinophils are also known to make an important contribution to mechanisms related to thrombosis pathogenesis in acute myocardial infarction. Increased platelet activity is observed in patients with MetS and these individuals are more susceptible to CVDs. In our study, elevated platelets described as dominant contributors to hypercoagulability and elevated eosinophil counts suggested to be related to the development of CVDs observed in boys may be the early indicators of the future cardiometabolic complications in this gender.

Keywords : children, complete blood count, gender, metabolic syndrome

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