

Neutrophil-to-Lymphocyte Ratio: A Predictor of Cardiometabolic Complications in Morbid Obese Girls

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Abstract : Obesity is a low-grade inflammatory state. Childhood obesity is a multisystem disease, which is associated with a number of complications as well as potentially negative consequences. Gender is an important universal risk factor for many diseases. Hematological indices differ significantly by gender. This should be considered during the evaluation of obese children. The aim of this study is to detect hematologic indices that differ by gender in morbid obese (MO) children. A total of 134 MO children took part in this study. The parents filled an informed consent form and the approval from the Ethics Committee of Namik Kemal University was obtained. Subjects were divided into two groups based on their genders (64 females aged 10.2±3.1 years and 70 males aged 9.8±2.2 years; p ≥ 0.05). Waist-to-hip as well as head-to-neck ratios and body mass index (BMI) values were calculated. The children, whose WHO BMI-for age and sex percentile values were ≥ 99 percentile, were defined as MO. Hematological parameters [haemoglobin, hematocrit, erythrocyte count, mean corpuscular volume, mean corpuscular haemoglobin, mean corpuscular haemoglobin concentration, red blood cell distribution width, leukocyte count, neutrophil %, lymphocyte %, monocyte %, eosinophil %, basophil %, platelet count, platelet distribution width, mean platelet volume] were determined by the automatic hematology analyzer. SPSS was used for statistical analyses. P ≤ 0.05 was the degree for statistical significance. The groups included children having mean±SD value of BMI as 26.9±3.4 kg/m² for males and 27.7±4.4 kg/m² for females (p ≥ 0.05). There was no significant difference between ages of females and males (p ≥ 0.05). Males had significantly increased waist-to-hip ratios (0.95±0.08 vs 0.91±0.08; p=0.005) and mean corpuscular hemoglobin concentration values (33.6±0.92 vs 33.1±0.83; p=0.001) compared to those of females. Significantly elevated neutrophil (4.69±1.59 vs 4.02±1.42; p=0.011) and neutrophil-to-lymphocyte ratios (1.70±0.71 vs 1.39±0.48; p=0.004) were detected in females. There was no statistically significant difference between groups in terms of C-reactive protein values (p ≥ 0.05). Adipose tissue plays important roles during the development of obesity and associated diseases such as metabolic syndrom and cardiovascular diseases (CVDs). These diseases may cause changes in complete blood cell count parameters. These alterations are even more important during childhood. Significant gender effects on the changes of neutrophils, one of the white blood cell subsets, were observed. The findings of the study demonstrate the importance of considering gender in clinical studies. The males and females may have distinct leukocyte-trafficking profiles in inflammation. Female children had more circulating neutrophils, which may be the indicator of an increased risk of CVDs, than male children within this age range during the late stage of obesity. In recent years, females represent about half of deaths from CVDs; therefore, our findings may be the indicator of the increasing tendency of this risk in females starting from childhood.

Keywords : children, gender, morbid obesity, neutrophil-to-lymphocyte ratio

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