World Academy of Science, Engineering and Technology
International Journal of Medical and Health Sciences
Vol:14, No:02, 2020

The Evaluation of Complete Blood Cell Count-Based Inflammatory Markers in Pediatric Obesity and Metabolic Syndrome

Authors : Mustafa M. Donma, Orkide Donma

Abstract : Obesity is defined as a severe chronic disease characterized by a low-grade inflammatory state. Therefore, inflammatory markers gained utmost importance during the evaluation of obesity and metabolic syndrome (MetS), a disease characterized by central obesity, elevated blood pressure, increased fasting blood glucose and elevated triglycerides or reduced high density lipoprotein cholesterol (HDL-C) values. Some inflammatory markers based upon complete blood cell count (CBC) are available. In this study, it was questioned which inflammatory marker was the best to evaluate the differences between various obesity groups. 514 pediatric individuals were recruited. 132 children with MetS, 155 morbid obese (MO), 90 obese (OB), 38 overweight (OW) and 99 children with normal BMI (N-BMI) were included into the scope of this study. Obesity groups were constituted using age- and sex-dependent body mass index (BMI) percentiles tabulated by World Health Organization. MetS components were determined to be able to specify children with MetS. CBC were determined using automated hematology analyzer. HDL-C analysis was performed. Using CBC parameters and HDL-C values, ratio markers of inflammation, which cover neutrophil-to-lymphocyte ratio (NLR), derived neutrophil-to-lymphocyte ratio (dNLR), platelet-to-lymphocyte ratio (PLR), lymphocyte-to-monocyte ratio (LMR), monocyte-to-HDL-C ratio (MHR) were calculated. Statistical analyses were performed. The statistical significance degree was considered as p < 0.05. There was no statistically significant difference among the groups in terms of platelet count, neutrophil count, lymphocyte count, monocyte count, and NLR. PLR differed significantly between OW and N-BMI as well as MetS. Monocyte-to HDL-C value exhibited statistical significance between MetS and N-BMI, OB, and MO groups. HDL-C value differed between MetS and N-BMI, OW, OB, MO groups. MHR was the ratio, which exhibits the best performance among the other CBC-based inflammatory markers. On the other hand, when MHR was compared to HDL-C only, it was suggested that HDL-C has given much more valuable information. Therefore, this parameter still keeps its value from the diagnostic point of view. Our results suggest that MHR can be an inflammatory marker during the evaluation of pediatric MetS, but the predictive value of this parameter was not superior to HDL-C during the evaluation of obesity.

Keywords : children, complete blood cell count, high density lipoprotein cholesterol, metabolic syndrome, obesity
Conference Title : ICOM 2020 : International Conference on Obesity and Metabolism
Conference Location : Dublin, Ireland
Conference Dates : February 13-14, 2020