

MetS-IR vs DMetSI in the Prediction of Cardiometabolic Risk in Children with Morbid Obesity and Metabolic Syndrome

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Abstract : Metabolic syndrome (MetS) is characterized, in the first instance, by central obesity accompanied by disturbed blood pressure, glucose, and certain lipid fractions. Pediatric MetS is the predictor of MetS in adulthood and is commonly associated with cardiovascular diseases (CVDs). Since MetS is such a complicated health problem, attempts have been made to eliminate this problem. For this, many formulas have been developed. However, most of them require sophisticated mathematical expressions, which makes their usage in clinics difficult. Out of the overall complications, the most important problem which drew attention was the possibility of developing CVDs. Alanine aminotransferase-to-aspartate aminotransferase (ALT-to-AST) ratio is proven to be linked to cardiometabolic risk. The aim of this study was to introduce the possible association of an easily applicable formula with the ALT-to-AST ratio. The study population was composed of eighty-eight morbid obese (MO) children. The first group was the MO group; the second group was the MetS group. Each group consisted of forty-four children. Ethics committee approval and informed consent forms were taken. World Health Organization obesity criteria and international diabetes federation metabolic syndrome criteria were used for the selection of the participants in groups. Blood pressure values were determined. Routine laboratory tests were performed. Alanine aminotransferase-to-aspartate aminotransferase ratio (ALT/AST), homeostatic model assessment for insulin resistance (HOMA-IR), metabolic syndrome insulin resistance index (MetS-IR), diagnostic obesity notation model assessment metabolic syndrome index (DMetSI) were calculated. Statistical evaluation of the data was performed. All indices exhibited increased values in the MetS group compared to those calculated for the MO group. The increase in the median values for MetS-IR in the MetS group was less than two-fold. On the other hand, about a three-fold increase was observed for DMetSI in the MetS group in comparison with the value obtained in the MO group. The correlation between ALT/AST ratio and DMetSI was stronger than the correlation between ALT/AST and MetS-IR. Besides, DMetSI had no sophisticated mathematical expressions in the formula. In conclusion, two indices, MetS-IR and DMetSI, which were found to be much higher in the MetS group, and associations of both with ALT/AST ratio have indicated their potential as the tools for use in the differential diagnosis of MO and MetS. However, much higher association with ALT/AST, both an insulin resistance as well as a cardiometabolic ratio, easily applicable nature of the equation, and striking difference between median values of groups suggested that DMetSI showed much higher performance during the selection of MetS cases from MO population of children than the other index.

Keywords : cardiometabolic risk, childhood, metabolic syndrome, metabolic syndrome index, morbid obesity

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