

Interpretation of Two Indices for the Prediction of Cardiovascular Risk in Pediatric Obesity

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Abstract : Obesity and weight gain are associated with increased risk of developing cardiovascular diseases and the progression of liver fibrosis. Aspartate transaminase-to-platelet count ratio index (AST-to-PLT, APRI) and fibrosis-4 (FIB-4) were primarily considered as the formulas capable of differentiating hepatitis from cirrhosis. Recently, they have found clinical use as measures of liver fibrosis and cardiovascular risk. However, their status in children has not been evaluated in detail yet. The aim of this study is to determine APRI and FIB-4 status in obese (OB) children and compare them with values found in children with normal body mass index (N-BMI). A total of sixty-eight children examined in the outpatient clinics of the Pediatrics Department in Tekirdag Namik Kemal University Medical Faculty were included in the study. Two groups were constituted. In the first group, thirty-five children with N-BMI, whose age- and sex-dependent BMI indices vary between 15 and 85 percentiles, were evaluated. The second group comprised thirty-three OB children whose BMI percentile values were between 95 and 99. Anthropometric measurements and routine biochemical tests were performed. Using these parameters, values for the related indices, BMI, APRI, and FIB-4, were calculated. Appropriate statistical tests were used for the evaluation of the study data. The statistical significance degree was accepted as $p < 0.05$. In the OB group, values found for APRI and FIB-4 were higher than those calculated for the N-BMI group. However, there was no statistically significant difference between the N-BMI and OB groups in terms of APRI and FIB-4. A similar pattern was detected for triglyceride (TRG) values. The correlation coefficient and degree of significance between APRI and FIB-4 were $r = 0.336$ and $p = 0.065$ in the N-BMI group. On the other hand, they were $r = 0.707$ and $p = 0.001$ in the OB group. Associations of these two indices with TRG have shown that this parameter was strongly correlated ($p < 0.001$) both with APRI and FIB-4 in the OB group, whereas no correlation was calculated in children with N-BMI. Triglycerides are associated with an increased risk of fatty liver, which can progress to severe clinical problems such as steatohepatitis, which can lead to liver fibrosis. Triglycerides are also independent risk factors for cardiovascular disease. In conclusion, the lack of correlation between TRG and APRI as well as FIB-4 in children with N-BMI, along with the detection of strong correlations of TRG with these indices in OB children, was the indicator of the possible onset of the tendency towards the development of fatty liver in OB children. This finding also pointed out the potential risk for cardiovascular pathologies in OB children. The nature of the difference between APRI vs FIB-4 correlations in N-BMI and OB groups (no correlation versus high correlation), respectively, may be the indicator of the importance of involving age and alanine transaminase parameters in addition to AST and PLT in the formula designed for FIB-4.

Keywords : APRI, children, FIB-4, obesity, triglycerides

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