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Gender Differences in Morbid Obese Children: Clinical Significance of Two Diagnostic Obesity Notation Model Assessment Indices

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Abstract : Childhood obesity is an ever increasing global health problem, affecting both developed and developing countries. Accurate evaluation of obesity in children requires difficult and detailed investigation. In our study, obesity in children was evaluated using new body fat ratios and indices. Assessment of anthropometric measurements, as well as some ratios, is important because of the evaluation of gender differences particularly during the late periods of obesity. A total of 239 children; 168 morbid obese (MO) (81 girls and 87 boys) and 71 normal weight (NW) (40 girls and 31 boys) children, participated in the study. Informed consent forms signed by the parents were obtained. Ethics Committee approved the study protocol. Mean ages (years)±SD calculated for MO group were 10.8±2.9 years in girls and 10.1±2.4 years in boys. The corresponding values for NW group were 9.0±2.0 years in girls and 9.2±2.1 years in boys. Mean body mass index (BMI)±SD values for MO group were 29.1±5.4 kg/m² and 27.2±3.9 kg/m²in girls and boys, respectively. These values for NW group were calculated as 15.5±1.0 kg/m² in girls and 15.9±1.1 kg/m²in boys. Groups were constituted based upon BMI percentiles for age-and-sex values recommended by WHO. Children with percentiles >99 were grouped as MO and children with percentiles between 85 and 15 were considered NW. The anthropometric measurements were recorded and evaluated along with the new ratios such as trunk-to-appendicular fat ratio, as well as indices such as Index-I and Index-II. The body fat percent values were obtained by bio-electrical impedance analysis. Data were entered into a database for analysis using SPSS/PASW 18 Statistics for Windows statistical software. Increased waist-to-hip circumference (C) ratios, decreased head-to-neck C, height ‘to’ ‘two’-‘to’-waist C and height ‘to’ ‘two’-‘to’-hip C ratios were observed in parallel with the development of obesity (p≤0.001). Reference value for height ‘to’ ‘two’-‘to’-hip ratio was detected as approximately 1.0. Index-II, based upon total body fat mass, showed much more significant differences between the groups than Index-I based upon weight. There was not any difference between trunk-to-appendicular fat ratios of NW girls and NW boys (p≥0.05). However, significantly increased values for MO girls in comparison with MO boys were observed (p≤0.05). This parameter showed no difference between NW and MO states in boys (p≥0.05). However, statistically significant increase was noted in MO girls compared to their NW states (p≤0.001). Trunk-to-appendicular fat ratio was the only fat-based parameter, which showed gender difference between NW and MO groups. This study has revealed that body ratios and formula based upon body fat tissue are more valuable parameters than those based on weight and height values for the evaluation of morbid obesity in children.

Keywords : anthropometry, childhood obesity, gender, morbid obesity
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