

Evaluation of Vitamin D Levels in Obese and Morbid Obese Children

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Abstract : Obesity may lead to growing serious health problems throughout the world. Vitamin D appears to play a role in cardiovascular and metabolic health. Vitamin D deficiency may add to derangements in human metabolic systems, particularly those of children. Childhood obesity is associated with an increased risk of chronic and sophisticated diseases. The aim of this study is to investigate associations as well as possible differences related to parameters affected by obesity and their relations with vitamin D status in obese (OB) and morbid obese (MO) children. This study included a total of 78 children. Of them, 41 and 37 were OB and MO, respectively. WHO BMI-for age percentiles were used for the classification of obesity. The values above 99 percentile were defined as MO. Those between 95 and 99 percentiles were included into OB group. Anthropometric measurements were recorded. Basal metabolic rates (BMRs) were measured. Vitamin D status is determined by the measurement of 25-hydroxy cholecalciferol [25-hydroxyvitamin D₃, 25(OH)D] using high-performance liquid chromatography. Vitamin D status was evaluated as deficient, insufficient and sufficient. Values \leq 20.0 ng/ml, values between 20-30 ng/ml and values $>$ 30.0 ng/ml were defined as vitamin D deficient, insufficient and sufficient, respectively. Optimal 25(OH)D level was defined as \geq 30 ng/ml. SPSSx statistical package program was used for the evaluation of the data. The statistical significance degree was accepted as $p \leq$ 0.05. Mean ages did not differ between the groups. Significantly increased body mass index (BMI), waist circumference (C) and neck C as well as significantly decreased fasting blood glucose (FBG) and vitamin D values were observed in MO group ($p \leq$ 0.05). In OB group, 37.5% of the children were vitamin D deficient, and in MO group the corresponding value was 53.6%. No difference between the groups in terms of lipid profile, systolic blood pressure (SBP), diastolic blood pressure (DBP) and insulin values was noted. There was a severe statistical significance between FBG values of the groups ($p \leq$ 0.001). Important correlations between BMI, waist C, hip C, neck C and both SBP as well as DBP were found in OB group. In MO group, correlations only with SBP were obtained. In a similar manner, in OB group, correlations were detected between SBP-BMR and DBP-BMR. However, in MO children, BMR correlated only with SBP. The associations of vitamin D with anthropometric indices as well as some lipid parameters were defined. In OB group BMI, waist C, hip C and triglycerides (TRG) were negatively correlated with vitamin D concentrations whereas none of them were detected in MO group. Vitamin D deficiency may contribute to the complications associated with childhood obesity. Loss of correlations between obesity indices-DBP, vitamin D-TRG, as well as relatively lower FBG values, observed in MO group point out that the emergence of MetS components starts during obesity state just before the transition to morbid obesity. Aside from its deficiency state, associations of vitamin D with anthropometric measurements, blood pressures and TRG should also be evaluated before the development of morbid obesity.

Keywords : children, morbid obesity, obesity, vitamin D

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