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25-Hydroxy Vitamin D Deficiency and its Relationship to Obesity and Other Risk Factors in a Group of Iranian Children and Adolescents

Heshmat Moayeri, Maral Ghasemzadeh

Tehran University of Medical Sciences, Tehran, Iran

Background: There is increasing evidence of vitamin D deficiency world-wide resulting in nutritional rickets. With increasing use of fast foods and reducing appropriate physical activity. Our world is encountered with the problem of obesity which increases the risk of 25-hydroxy vitamin D deficiency.

Objective and hypotheses: The aim of this study was to determine the status of serum 25(OH)D level in children 2–14 years old who visited in a pediatric endocrinology clinic between 2012 between 2014. We also examined the relationships between serum 25(OH)D deficiency and obesity, age, sex, skin color, season, sun exposure index, and diary intake.

Method: Using a cross sectional design, serum 25(OH)D level, the amount of diary intake, BMI percentile and BMI Z-score for age and sex, sun exposure index, were measured in 170 children (2–14 years old) living in Tehran. Our data was analysed using Pearsons correlation test, linear regression test, independent *t*-test, χ^2 -test and ANOVA test. All the children were divided into four groups according to their level of 25(OH)D. On the base of our review of literatures, we use the cut off 30 ng/ml as the optimal level of 25(OH)D, 20–30 ng/ml as 25(OH)D insufficiency, 10–20 ng/ml as moderate deficiency and under 10 ng/ml as severe vitamin D deficiency.

Results: The mean serum 25(OH)D level was 21.37 ± 11.54 ng/ml, and 23% of subjects had severe vitamin D deficiency and 78% of subjects did not have optimal 25(OH)D level. 25(OH)D levels were negatively and significantly correlated with BMI, BMI percentile, BMI Z-score and age. 25(OH)D level was positively and significantly correlated with diary intake and sun exposure index. Prevalence of severe vitamin D deficiency was significantly higher among girls than the boys and prevalence of severe vitamin D deficiency was significantly higher during winter. Prevalence of severe 25(OH)D deficiency was significantly higher in obese group. Overall we can conclude that our children especially obese, girls, those who are in pre pubertal and pubertal age with rapid growth, are at high risk of 25(OH)D deficiency and its subsequence and prevalence of severe vitamin D deficiency in subjects whose 25(OH)D were measured during summer was significantly higher than winter group (P value=0.03). Prevalence of severe 25(OH)D deficiency was significantly (P value <0.001) higher in obese group (BMI percentile for age and sex >95 and BMI Z-score >1.5). Overall we can conclude that our children specially obese, girls, those who are in prepubertal and pubertal age with rapid growth, are at high risk of 25(OH)D deficiency and its subsequence.

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