Obesity and vitamin D deficiency among Children

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Abstract:
Background: Adequate vitamin D is essential for skeletal health in developing children. Vitamin D deficiency and insufficiency are epidemic but commonly undiagnosed among obese children. Obese children in turn have higher risk of hypovitaminosis D.
Introduction: Previous findings indicated that 25OHD is significantly lower and immunoreactive parathyroid hormone is significantly higher in obese compared with nonobese individuals. Compared with healthy-weight children, overweight, obese, and severely obese children had significantly greater adjusted odds of vitamin D deficiency. Obese children and adolescents are at a greater risk of vitamin D deficiency because vitamin D is thought to be sequestered by excess adipose tissue. Poor vitamin D status has been associated with a higher prevalence of the metabolic syndrome, type 2 diabetes. Childhood obesity is accompanied by low-grade systemic inflammation, which contributes to the development of insulin resistance and cardiovascular complications later in life. As vitamin D exhibits profound immunomodulatory functions and vitamin D deficiency is highly prevalent in childhood obesity, vitamin D deficiency in childhood obesity coincides with enhanced systemic inflammation and reduced insulin sensitivity. The high cathepsin S and sVCAM levels may reflect activation of a pro-inflammatory, pro-diabetic and atherogenic pathway, which could be inhibited by vitamin D supplementation. serum 25(OH) D was positively correlated with insulin sensitivity, which was fat mass mediated, but negatively correlated with HbA1c, implying that obese children and adolescents with low vitamin D status may be at increased risk of developing impaired glucose metabolism independent of body adiposity.
Conclusion: Vitamin D deficiency is highly prevalent in overweight and obese children. The particularly high prevalence in severely obese and minority children suggests that targeted screening and treatment guidance is needed. The correction of poor vitamin D status through dietary supplementation may be an effective addition to the standard treatment of obesity and its associated insulin resistance.

Key words: Vitamin D deficiency, Children, Obesity