Association between Body Mass Index and Insufficient Levels of Vitamin D and B12 among Adolescents and Young Adults: An Early Opportunity to Prevent Metabolic Complications

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ABSTRACT

Obesity and overweight prevalence increased worldwide, especially among adolescents and young adults. Identification of modifiable environmental risk factors, including nutritional deficiencies, is a key step for early prevention of obesity related complications. Objective: This study explores the relation between body mass index categories and Vitamin D & Vitamin B12 status in adolescents and young adults. A cross-sectional descriptive analytical study conducted between January 2023 to March 2025 from a university hospital in Riyadh region. A sample of 232 healthy subjects aged 14 to 25 years of both sexes were included. Data collected from the laboratory investigations database of the hospital, and revised subjects' hospital files were categorized according to body mass index, and groups were compared regarding the standards of measured serum levels of Vitamin D and Vitamin B12. Among the studied population, 12.1% were underweight, 40.9% were of average weight, 28.9% were overweight, and 18.1% were obese. Vitamin D and Vitamin B12 serum levels have a statistically significant negative correlation with body mass index. In comparison to lean subjects, Vitamin B12 deficiency was higher in the obese group (31% vs 10.6%) while Vitamin B12 insufficiency was in the overweight group (40.9% vs 10.6%). While Vitamin D deficiency was statistically significant higher in obese (66.7%), overweight (65.1%), and underweight subjects (55.6%) in comparison to those with average weight (39.8%). Among adolescents and young adults, increased body mass index is strongly associated with low levels of both Vitamin D & B12, which is not limited to those with obesity but also occurs at a high rate in overweight subjects. Adolescents and young adults' nutritional screening allows early detection of nutritional insufficiency as an early opportunity to prevent metabolic complications.

Keywords: Obesity, overweight, Vitamin D, Vitamin B12, adolescents

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