

Abstract

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Adequacy of vitamin D replacement in severe deficiency is dependent on body mass index.

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BACKGROUND: Obesity is associated with hypovitaminosis D. Whether body mass index (BMI) determines the replacement dose of vitamin D to achieve sufficiency is unclear.

OBJECTIVE: To determine the relationship between BMI and serum 25-OH vitamin D concentrations and whether the increase in serum 25-OH vitamin D concentrations with vitamin D replacement is dependent on BMI.

METHODS: Retrospective review of anthropometric data and serum 25-OH vitamin D concentrations in 95 patients attending an outpatient clinic in a tertiary hospital. In a second component of the study, 17 hospital inpatients with severe vitamin D deficiency (serum 25-OH D concentrations <6 ng/mL [15 nmol/L]) were supplemented with 10,000 units vitamin D(3)/day orally for 1 week. Biochemistry and anthropometric measurements were compared before and after vitamin D replacement.

RESULTS: Serum 25-OH vitamin D concentrations correlated negatively with BMI in the 95 outpatients ($r(2) = 0.11$, $P < .01$). In the longitudinal study, BMI correlated positively with serum intact parathyroid hormone ($r(2) = 0.84$, $P < .01$) and negatively with 1.25-(OH)(2) vitamin D ($r(2) = 0.19$, $P = .06$) at baseline. Serum 25-OH D concentrations achieved following 1 week of vitamin D(3) replacement correlated negatively with BMI ($r(2) = 0.63$, $P < .01$).

CONCLUSION: Efficacy of vitamin D supplementation is dependent on BMI. Overweight and obese patients with hypovitaminosis D might require higher doses of vitamin D to achieve vitamin D repletion compared with individuals with normal body weight.

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