Vitamin D and its role in obesity and other associated conditions

av

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Abstract

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Vitamin D has received much attention in recent years due to the re-emergence of vitamin D deficiency as a global health issue along with increasing evidence indicating that 1,25-dihydroxivitamin D, the hormonally active form of vitamin D, not only acts in calcium and bone metabolism but also generates extraskeletal biological responses.

In this thesis, the role of vitamin D in obesity and other associated conditions has been studied.

In paper 1, the prevalence of vitamin D deficiency and secondary hyperparathyroidism over the long term after Roux-en-Y gastric bypass (RYGB) were evaluated. We found a substantial prevalence of vitamin D deficiency and secondary hyperparathyroidism after RYGB, whereas calcium levels remained within normal range. An expected improvement in vitamin D status after weight loss could have been countered by the malabsorption induced by surgery.

In paper 2, the prevalence of anemia and related deficiencies over the long term after RYGB were studied. We found that 27% of the patients had anemia postoperatively, 20% had iron deficiency, 12% had folate deficiency and 2% had vitamin B₁₂ deficiency. Anemia was mainly due to iron deficiency, and its frequency did not seem to progress with time after surgery.

In paper 3, the effects of vitamin D supplementation on body composition and cardiorespiratory fitness in overweight men with vitamin D deficiency at baseline were investigated. No statistically significant difference between the placebo and the intervention group regarding changes in percentage body fat, maximum oxygen uptake, BMI and maximum load was found.

In paper 4, the prevalence and determinants of 3-epi-25(OH)D₃ were examined. 3-epi-25(OH)D₃ was detected in 7.7% of the study population and the mean concentration was 8.4 nmol/L. The quantification of 3-epi-25(OH)D₃ would not significantly influence the clinical interpretation of vitamin D levels.

In conclusion, new knowledge about vitamin D is continuously emerging but there is a discrepancy between cross-sectional studies associating low vitamin D levels to obesity and other related metabolic complications and the lack of effects of vitamin D supplementation in clinical trials. Large RCTs with longer duration in obese subjects with baseline vitamin D deficiency are warranted.

Keywords: Vitamin D, obesity, Roux-en-Y gastric bypass, secondary hyperparathyroidism, anemia, iron deficiency, body composition, cardiorespiratory fitness, Vitamin D C₃ epimer.

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