

Abstract

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Vitamin D supplementation enhances the beneficial effects of weight loss on cardiovascular disease risk markers.

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BACKGROUND: High blood concentrations of parathyroid hormone and low concentrations of the vitamin D metabolites 25-hydroxyvitamin D [25(OH)D] and calcitriol are considered new cardiovascular disease risk markers. However, there is also evidence that calcitriol increases lipogenesis and decreases lipolysis.

OBJECTIVE: We investigated the effect of vitamin D on weight loss and traditional and nontraditional cardiovascular disease risk markers in overweight subjects.

DESIGN: Healthy overweight subjects (n = 200) with mean 25(OH)D concentrations of 30 nmol/L (12 ng/mL) received vitamin D (83 microg/d) or placebo in a double-blind manner for 12 mo while participating in a weight-reduction program.

RESULTS: Weight loss was not affected significantly by vitamin D supplementation (-5.7 +/- 5.8 kg) or placebo (-6.4 +/- 5.6 kg). However, mean 25(OH)D and calcitriol concentrations increased by 55.5 nmol/L and 40.0 pmol/L, respectively, in the vitamin D group but by only 11.8 nmol/L and 9.3 pmol/L, respectively, in the placebo group (P < 0.001), whereas a more pronounced decrease occurred in the vitamin D group than in the placebo group in blood concentrations of parathyroid hormone (-26.5% compared with -18.7%; P = 0.014), triglycerides (-13.5% compared with +3.0%; P < 0.001), and the inflammation marker tumor necrosis factor-alpha (-10.2% compared with -3.2%; P = 0.049). The beneficial biochemical effects were independent of the loss in body weight, fat mass, and sex. However, compared with placebo, vitamin D supplementation also increased LDL-cholesterol concentrations (+5.4% compared with -2.5%; P < 0.001).

CONCLUSIONS: The results indicate that a vitamin D supplement of 83 microg/d does not adversely affect weight loss and is able to significantly improve several cardiovascular disease risk markers in overweight subjects with inadequate vitamin D status participating in a weight-reduction program. This trial was registered at clinicaltrials.gov as NCT00493012.

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