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Rising serum 25-hydroxy-vitamin D levels after weight loss in obese women correlate with improvement in insulin resistance.

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Abstract

OBJECTIVE: The objective of the study was to examine changes of 25-hydroxy-vitamin D (25OHD) and PTH blood levels 4 and 20 wk after low-calorie diet-induced weight loss.

METHODS: Forty-four obese women [aged 40.6 +/- 11.4 yr, body mass index (BMI) 36.7 +/- 4.9 kg/m(2)] and 25 controls (BMI 22.9 +/- 1.5 kg/m(2)) were examined. Anthropometric and cardiometabolic parameters and 25OHD and PTH levels were determined at baseline and 4 and 20 wk after a low-calorie diet.

RESULTS: At baseline, 25OHD levels were lower in obese compared with control subjects (17 +/- 6.0 vs. 23.8 +/- 8.7 ng/ml, P < 0.001), whereas no differences were found in PTH levels. In all women, a negative correlation was found between 25OHD levels and body weight (BW) (r -0.32, P < 0.001), BMI (r -0.37, P < 0.001), waist circumference (r -0.26, P < 0.05), and percent fat mass (r -0.38, P = 0.001) as determined by bioelectrical impedance analysis. The 4-wk low-calorie diet (n = 37) reduced BW and led to significant improvements in the homeostasis model assessment (HOMA) index and lipid levels. The 20-wk low-calorie diet (n = 26) resulted in reduction of BW and BMI by 10%, HOMA index (4.7 +/- 3.8 vs. 3.10 +/- 1.7, P < 0.01), and lipids levels (except high density lipoprotein cholesterol) and increase in 25OHD (15.4 +/- 6.0 vs. 18.3 +/- 5.1 ng/ml, P < 0.05), compared with baseline. PTH levels were unchanged. The increase of 25OHD levels was associated with the reduction of insulin levels and HOMA index (r -0.43, P < 0.05).

CONCLUSIONS: Blood 25OHD levels were low in obese women and correlated inversely with severity measures of obesity. Weight loss of 10% after low-calorie diet increased 25OHD levels, and this increase was mainly associated with improvement of insulin resistance.

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