

VITAMINS / SUPPLEMENTS

Defending With Vitamin D: Helps Prevent Progression to Diabetes

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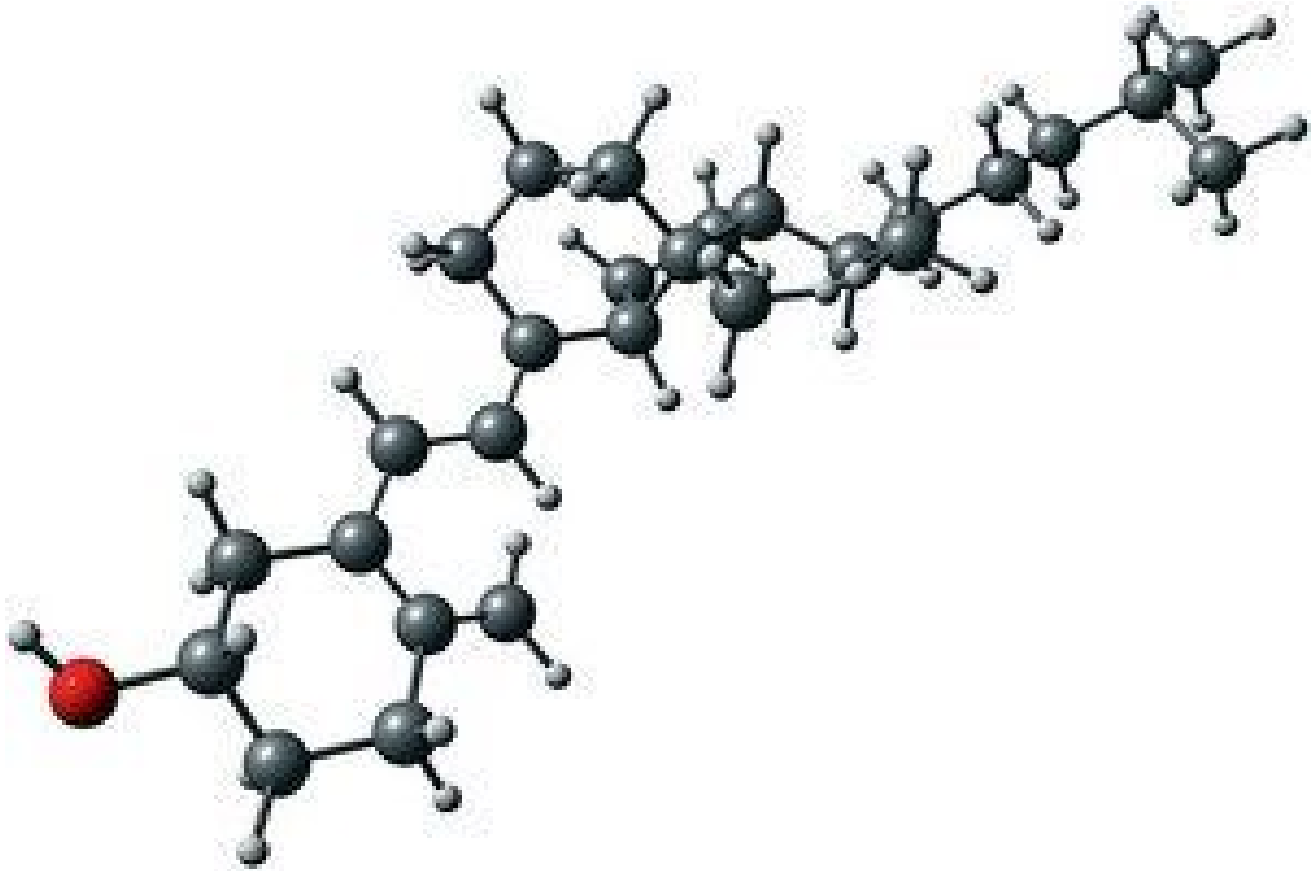
A 2014 clinical trial published in the *American Journal of Clinical Nutrition* provides additional evidence that optimal vitamin D nutritional status may be important in preventing the progression of [prediabetes](#) to diabetes in prediabetic adults.¹ Previous studies have shown that a low serum vitamin D level is associated with insulin resistance, metabolic syndrome and type 2 diabetes.

Study Parameters

Researchers examined the effect of vitamin D supplementation on insulin sensitivity and β cell function in overweight, vitamin D-deficient, non-Western immigrants who were at high risk of diabetes. Researchers recruited a total of 130 non-Western immigrants with prediabetes who lived in The Netherlands. Individuals qualified to be in the study if they had a fasting glucose concentration above 5.5 mmol/L (99 mg/dL) or a random glucose concentration between 7.8 to 11.1 mmol/L (140-200 mg/dL), as well as documented vitamin D deficiency (serum 25-hydroxycholecalciferol level below 50 nmol/L or 20 ng/mL).

During the 16-week, randomized, placebo-controlled trial, subjects were randomly assigned vitamin D supplementation (1,200 IU per day) or a placebo. All participants also received 500 mg of calcium supplementation as calcium carbonate.

Results / Context



After four months of intervention, each subject underwent an oral [glucose tolerance test](#) via the administration of 75 grams of oral glucose. The results showed that mean serum vitamin D concentrations increased significantly in the vitamin D-treated group compared to the placebo group, with the former showing an average increase of 38 nmol/L (15 ng/mL) compared to the latter.

When patients who had diabetes at the outset of the study were excluded from the final data, a significant increase in the insulinogenic index was observed in prediabetic subjects who obtained a vitamin D concentration ≥ 60 nmol/L (24 ng/mL).

The insulinogenic index, a well-documented test that establishes beta cell function (BF) within the pancreas, is the ratio of insulin concentration at 30 minutes minus fasting insulin, to the difference of glucose at same time. Researchers concluded that improvement in the insulinogenic index was observed in prediabetic subjects who obtained a vitamin D concentration ≥ 60 nmol/L (24 ng/ml).²

It is worth noting that in a previous study A. Belenchia, et al., tested the efficacy and safety of 4,000 IU vitamin D per day in a group of obese (average BMI above 39.8) diabetic adolescents. Compared to the control group, the vitamin D-supplemented group showed a significant increase in serum 25-hydroxycholecalciferol levels and fasting insulin, as well as improved insulin sensitivity. The researchers concluded that the correction of suboptimal vitamin D status through dietary supplementation may be an effective addition to the standard treatment of obesity and its associated insulin resistance.³

Take-Home Points

Based on emerging data, it appears prudent to suggest overweight patients with diabetes or prediabetes undergo a blood test to determine their serum level of 25-hydroxycholecalciferol. If their vitamin D blood level is below 60 nmol/L (24 ng/mL), then it seems prudent to recommend sufficient vitamin D supplementation to raise their vitamin D blood levels into the more desirable range.

Some studies suggest the optimal vitamin D serum concentration of 25-hydroxycholecalciferol for reducing insulin resistance is between 80-119 nmol/L (32-48 ng/mL).⁴ To achieve this level, vitamin D supplementation between 1,200 and 4,000 IU per day is frequently required.^{1,4-5} Thus, in addition to exercise, a lower glycemic diet, avoiding overeating, intake of supplements known to improve insulin sensitivity and thermogenesis, vitamin D supplementation is another simple, cost-effective intervention that appears to be highly beneficial for a select group of diabetic and prediabetic patients who exhibit suboptimal serum levels of 25-hydroxycholecalciferol.

References

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