Raising low vitamin D levels lowers risk of prediabetes progressing to diabetes

23 June 2014

Vitamin D and calcium supplementation along with diet and exercise may prevent type 2 diabetes in prediabetic individuals who have insufficient vitamin D in their bodies, a study from India suggests. The results were presented Saturday at the joint meeting of the International Society of Endocrinology and the Endocrine Society: ICE/ENDO 2014 in Chicago.

Vitamin D deficiency has been linked to prediabetes, which is a blood glucose, or sugar, level that is too high but not high enough to be considered diabetes. It is unclear, however, if bringing low vitamin D blood levels to normal through supplementation will affect progression to diabetes.

In the new study, every unit increase in vitamin D level after supplementation of the vitamin decreased the risk of progression to diabetes by 8 percent, the authors reported.

"Without healthy lifestyle changes, nothing works to prevent diabetes in at-risk individuals," said the lead author, Deep Dutta, MD, DM, a research officer at the Institute of Postgraduate Medical Education & Research and Seth Sukhlal Karnani Memorial Hospital in Calcutta, India. "However, our results are encouraging because the addition of vitamin D and calcium supplements is easy and low in cost."

"If our results are confirmed in a large multicenter trial," Dutta said, "vitamin D supplementation would provide us with a new tool in the armamentarium of diabetes prevention strategies."

The West Bengal chapter of the Research Society for the Study of Diabetes in India funded this study. Of 170 individuals with prediabetes who had not taken vitamin D supplements in the past six months, 125 had vitamin D deficiency or insufficiency, which the researchers defined as a vitamin D blood level (25-hydroxyvitamin D) of 30 nanograms per milliliter (ng/mL) or less. These 125 study subjects were randomly assigned to one of two treatment groups. In the first group, 68 subjects received ready-to-mix, powdered vitamin D3 (cholecalciferol, D-Rise sachets, USV Ltd., Mumbai, India) at a dose of 60,000 International Units (IU) once weekly for eight weeks and then monthly. They also received a daily 1,250-milligram calcium carbonate tablet.

The other group of 57 subjects received only calcium supplements. Both groups received advice to eat a healthy, calorie-appropriate diet and to engage in brisk exercise for 30 minutes each day.

The researchers analyzed results for subjects who had at least a year of follow-up tests. After an average of nearly two years and four months' follow-up, only six of 55 subjects (10.9 percent) in the group that received vitamin D plus calcium supplementation had become diabetic, whereas diabetes developed in 13 of 49 individuals (26.5 percent) in the calcium-alone group. Blood sugar levels reportedly became normal in about twice as many people in the vitamin D group as in the group that did not get vitamin D supplementation: 23 of 55 subjects versus 10 of 49 subjects, respectively (41.8 percent versus 20.4 percent).

At the end of the study, those who received vitamin D supplementation had much higher vitamin D levels in the blood and lower fasting blood glucose levels compared with the other group. Every unit (1 ng/mL) increase in vitamin D in the body was associated with a 5.4 percent increased chance of reversal to normal blood sugar levels, Dutta reported.

He said the greater reversal to normal blood sugar in the vitamin D group presumably occurred through improvements in their insulin resistance and inflammation.

Provided by The Endocrine Society