Summary for Patients: Vitamin D and Risk for Type 2 Diabetes in People With Prediabetes

From: Pittas AG, Kawahara T, Jorde R, et al. Vitamin D and risk for type 2 diabetes in people with prediabetes. A systematic review and meta-analysis of individual participant data from 3 randomized clinical trials. Ann Intern Med. 7 February 2023. [Epub ahead of print]. doi:10.7326/M22-3018

This article was published at Annals.org on 7 February 2023.

What is the problem and what is known about it so far?

Vitamin D is a fat-soluble vitamin that is naturally present in a few foods, added to others, and available as a dietary supplement or by prescription at higher doses. It is also produced by the body when ultraviolet rays from sunlight strike the skin. Vitamin D has many functions in the body, including a role in insulin secretion and glucose metabolism. Observational studies have found an association between having a low level of vitamin D in the blood and high risk for developing diabetes.

Why did the researchers do this particular study?

The authors wanted to know whether giving vitamin D to people who were at high risk for diabetes could reduce the risk for diabetes.

Who was studied?

The authors searched 3 databases through 9 December 2022 for trials that were specifically done to compare the use of vitamin D versus placebo for diabetes prevention in adults with prediabetes.

How was the study done?

The authors obtained data on individual participants from 3 trials. After checking the quality of the data, they harmonized the data into standard units with unified coding. They then used statistical approaches to compare the rates of diabetes in patients who received vitamin D compared with those who received placebo.

What did the researchers find?

Over 3 years of follow-up, new-onset diabetes occurred in 22.7% of adults who received vitamin D and 25.0% of those who received placebo. This translates to being 15% less likely to develop diabetes with vitamin D. About 30 adults with prediabetes would need to be treated with vitamin D to prevent 1 person from developing diabetes.

What were the limitations of the study?

The vitamin D doses varied among the studies but were around or above the tolerable upper intake level recommended by the Institute of Medicine's Dietary Reference Intakes. One study used 20,000 units of cholecalciferol (vitamin D_3) weekly, another used 4000 units of cholecalciferol daily, and the third study used 0.75 micrograms of eldecalcitol, which is a synthetic analogue of vitamin D. In addition, the authors looked at the rate of adverse events, but they were rare, and thus this study could not draw any definite conclusions about safety.

What are the implications of the study?

In adults with prediabetes, vitamin D was effective in lowering the risk for developing diabetes.

Summaries for Patients are a service provided by *Annals* to help patients better understand the complicated and often mystifying language of modern medicine.

Ann Intern Med. doi:10.7326/P22-0031