Can vitamin D help prevent diabetes? Possibly, if you have the right genes

Vitamin D may help prevent diabetes in some people, depending on genes, according to a new study. Guido Mieth/Getty Images

- Vitamin D, which is mainly obtained from sunlight exposure, followed by dietary sources such as oily fish and dairy, plays an important role in our overall health.
- Previous studies have linked vitamin D deficiency to a higher risk for certain diseases, including type 2 diabetes.
- A new study found that vitamin D supplements may help delay or prevent disease progression in those with prediabetes who also have specific variations in their vitamin D receptor gene.

Vitamin D, obtained through exposure to sunlight and eating certain foods like fatty fish and egg yolks, plays an important role in our overall health.

Past research shows that vitamin D is important for bone healthTrusted Source, including keeping bones strong and helping prevent musculoskeletal issues like weak muscles, and supports the body's immune system.

Previous studies have linked vitamin D deficiency to a higher risk for certain diseases, including cardiovascular disease, certain cancers, multiple sclerosis, dementia, and type 2 diabetesTrusted Source.

Now, a new study published in the journal JAMA Network OpenTrusted Source reports that vitamin D supplementation may help delay or prevent disease progression in those with prediabetes who also have specific variants in their vitamin D receptor gene.

Previous research leading to the latest vitamin D study

For this study, researchers analyzed healthcare data from participants of the previous D2d study, which examined the potential effects of vitamin D supplementation on the prevention of type 2 diabetes.

During the original study, researchers concluded that a 4000 IU daily vitamin D supplement did not result in a significantly lower risk of type 2 diabetes when compared to a placebo.

However, researchers reportedly still wanted to know whether vitamin D supplementation could help anyone with prediabetes, which led to this study.

In another D2d-related study, scientists discovered that blood levels of 40 to 50 ng/mL of 25-hydroxyvitamin (OH) D or higher were correlated with a substantial lowering in participants' diabetes development risk.

"A number of observational studies had reported an inverse association between the circulating 25(OH)D level and diabetes risk," Bess Dawson-Hughes, MD, a senior scientist at the Jean Mayer USDA Human Nutrition Research Center on Aging at Tufts University, and lead author of this study, told Medical News Today.

"This was plausible because there are known vitamin D receptors in the beta cells in the pancreas, which secrete insulin. The observational data needed to be tested in a randomized controlled vitamin D intervention trial in order to establish that vitamin D actually influenced diabetes risk."

Vitamin D lowers diabetes risk in 2 specific gene variants

For this latest study, Dawson-Hughes and her team analyzed genetic data from about 2,000 participants of the original D2d study.

At the study's conclusion, researchers found that participants with the AA variant of the Apal vitamin D receptor gene didn't respond to a daily high dose of vitamin D compared with placebo.

However, study participants with the AC or CC gene variants did respond, experiencing a 19% lower risk of developing type 2 diabetes when taking a high daily dose of vitamin D.

"If confirmed, this finding defines an effective strategy to lower the risk of type 2 diabetes in adults with prediabetes," Dawson-Hughes said. "Taking a single vitamin D capsule daily requires relatively little time and effort, is inexpensive, and is generally safe."

She also noted that these findings may aid future precision medicine for type 2 diabetes.

"Our finding, if confirmed, would allow high dose vitamin D to be targeted to individuals with prediabetes who have the genetic potential to benefit," Dawson-Hughes explained.

> "Apart from the concept of genetic responders and non-responders, it appears from work by our lab and others that the relatively high 25(OH)D levels needed to reduce type 2 diabetes risk may, in fact, increase risk of falling in older adults. This underscores the need for clinicians to weigh the potential risk and benefit of treatment with 4000 IU per day of vitamin D in individual patients."
>
> — Bess Dawson-Hughes, MD

Promise of potentially more personalized medicine

MNT spoke with Jennifer Cheng, DO, chief of endocrinology at Hackensack Meridian Jersey Shore University Medical Center in New Jersey, about this study, who commented that it's an interesting study that highlights the importance of having a personalized approach to treating our patients.

> "It's promising, and my reaction is cautious optimism. The study suggests that vitamin D administration, in high risk individuals with certain genetic types, may be beneficial in preventing diabetes. It shows that in the future, we may be doing genetic testing to help determine if certain therapies can be used."
>
> — Jennifer Cheng, DO

"This is promising to have potentially more personalized medicine where genetic types can be analyzed to help determine if certain therapies are recommended or not," Cheng said. "More research is needed to see if there are other factors that are associated with risk reduction."

Cheng said the next areas for research should be additional studies to see how different genetic factors and other factors impact the risk for the development of diabetes.

"The development of diabetes is so multifactorial and associated with other genetic factors that we are not able to elucidate," she continued. "Further, research and evaluation should be done to determine what are all the factors associated with increased risk of developing diabetes, to help mitigate those risk factors in high risk individuals."

Taking too much vitamin D may come with risks

MNT also spoke with Pouya Shafipour, MD, a board certified family and obesity medicine physician at Providence Saint John's Health Center in Santa Monica, CA, who said that it's important for researchers to continue to find new ways to help people potentially lower their type 2 diabetes risk because it is such a complex condition.

"And it's so on the rise that anything we can find to lower it, reverse it, control it, then we can control or reduce heart disease riskTrusted Source, we can reduce cancer, dementia, blindness, (and) nerve pain," Shafipour detailed.

> "[Type 2 diabetes is] a disease that impacts the entire body, so if we can use anything from diet, lifestyle supplements, vitamins, medications, weight loss, improving sleep, to reverse

this, we can impact one's entire life and significantly improve the quality of their life, longevity, and a lot of other disease reversal."

— Pouya Shafipour, MD

Shafipour also said this study's findings should be taken with a grain of salt because vitamin D supplementation helps only certain populations with this genetic variant.

"So people shouldn't rely on this study and then start taking high doses of vitamin D because mega doses of vitamin D can cause kidney stones, can cause toxicity, especially in people that [have obesity], as it's a fat-soluble vitamin," he explained.

"This is where precision medicine comes in, that they should talk to their provider about it, have their levels checked, and really see if it's something that benefits them particularly, or do they need to take vitamin D for other reasons," he added.

News Source:

https://www.medicalnewstoday.com/articles/vitamin-d-supplements-help-prevent-type-2-diabetes-right-gene-variants#Taking-too-much-vitamin-D-may-come-with-risks