

NUTRITION

Vitamin D improves blood pressure in type 2 diabetes

A single oral dose of vitamin D₃ reduces systolic blood pressure and levels of B-type natriuretic peptide (BNP), a marker of cardiovascular risk, in patients with type 2 diabetes mellitus (T2DM), data of a randomized, controlled trial reveal.

“A lot of observational studies show a link between low vitamin D levels and both T2DM and high blood pressure,” comments lead researcher Miles D. Witham of the University of Dundee, Scotland. “What is missing at the moment are intervention studies to test whether giving vitamin D can actually improve vascular health in this high-risk group of patients.”

The team had previously shown that a single oral dose of 100,000 IU vitamin D₂ reduced blood pressure and improved endothelial function (an indicator of vascular health) in patients with T2DM and levels of 25-hydroxyvitamin D <50 nmol/l. However, they wanted to find out whether a larger single dose of vitamin D₃ (200,000 IU) would produce greater improvements and might also have an effect on glycemic control. “We chose to use a large oral dose of vitamin D as we know it lasts for several weeks, and so it doesn’t add to the daily burden of tablets that most patients with T2DM already have to take,” explains Witham.

The researchers randomly allocated 61 patients with T2DM and 25-hydroxyvitamin D levels <100 nmol/l

to a single oral dose of vitamin D₃ of 100,000 IU or 200,000 IU or placebo. The investigators measured markers of the participants’ vascular health and glycemic control, including blood pressure, endothelial function and levels of HbA_{1c} and BNP, at baseline and at 8 and 16 weeks.

Mean systolic blood pressure was significantly lower at 8 weeks in the groups who received vitamin D₃ than the placebo group, after adjustment for baseline differences. However, the vitamin D supplement did not significantly reduce mean diastolic blood pressure at 8 weeks and the effect of the dose on systolic blood pressure was attenuated by 16 weeks. BNP levels were also significantly lower at 16 weeks in the 200,000 IU vitamin D₃ group than the placebo group. By contrast, vitamin D₃ did not significantly improve glycemic control or endothelial function. Witham *et al.* infer that the lack of improvement in endothelial function with vitamin D observed in this but not their previous study might reflect the fact that more patients in the current study were taking statins and angiotensin-converting enzyme inhibitors—medications that could already have improved endothelial function.

“Our results are a promising start, but more work is needed before vitamin D



becomes a routine intervention, even for the majority of patients with T2DM who have low vitamin D levels. Large trials are needed to test whether vitamin D can actually reduce deaths and cardiovascular events,” concludes Witham.

Carol Wilson

Original article Witham, M. D. *et al.* The effect of different doses of vitamin D₃ on markers of vascular health in patients with type 2 diabetes: a randomised controlled trial. *Diabetologia* doi:10.1007/s00125-010-1838-1