

Genetic research clarifies link between hypertension and vitamin D deficiency

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Low levels of vitamin D can trigger hypertension, according to the world's largest study to examine the causal association between the two. Although observational studies have already shown this link, a large-scale genetic study was necessary before the cause and effect could be proven, the annual conference of the European Society of Human Genetics (ESHG) will hear today (Tuesday).

Dr. Vimal Karani S, from the Institute of Child Health, University College London, London, UK, will tell the meeting that data from the D-CarDia collaboration, involving 35 studies, over 155,000 individuals, and numerous centres in Europe and North America, showed that those with high concentrations of 25-hydroxyvitamin D (25(OH)D) had reduced blood pressure and therefore a reduced risk of hypertension. "We knew from earlier [observational studies](#) that low 25(OH)D concentrations were likely to be associated with increases in blood pressure and hypertension, but correlation is not causality", he says. "Additionally, [randomised controlled trials](#) of vitamin D supplementation in humans have produced inconsistent effects on [cardiovascular outcomes](#). The whole picture was somewhat confused, and we decided to try to figure it out once and for all."

The researchers used genetic variants known as [single nucleotide polymorphisms](#), or [SNPs](#), as proxy markers to reflect individual's vitamin D status in order to test for a causal association with blood pressure and hypertension. When the results were analysed, they found a significant link; for every 10% increase in 25(OH)D concentrations,

there was a 8.1% decrease in the risk of developing hypertension.

"Even with the likely presence of unobserved confounding factors", Dr. Karani S will say, "the approach we followed, known as Mendelian randomisation, allows us to draw conclusions about causality because the [genetic influence](#) on disease is not affected by confounding. To put it in simple terms, by using this approach we can determine the cause and effect and be pretty sure that we've come to the right conclusion on the subject."

Low vitamin D status is common throughout the western world, the researchers say, and hence these data have important public health implications. The best-known manifestation of vitamin D deficiency is the childhood bone disease rickets, where long bones are weakened by the deficiency and start to bend. Recently, however, Vitamin D has been implicated in a number of other non-skeletal-related conditions, but studies involving supplementation have given conflicting results.

"Our study strongly suggests that some cases of cardiovascular disease could be prevented through vitamin D supplements or food fortification", says Dr. Karani S. "Our new data provide further support for the important non-skeletal effects of vitamin D. We now intend to continue this work by examining the causal relationship between vitamin D status and other cardiovascular disease-related outcomes such as lipid-related phenotypes, for example, cholesterol, inflammatory markers such as C-reactive protein, and type 2 diabetes and markers of glucose metabolism. We believe that we still have a lot to find out about the effect of Vitamin D deficiency on health, and we now know that we have the tools to do so."

Provided by European Society of Human Genetics

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