Genetic study suggests causal link between vitamin D deficiency and hypertension

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New genetic research provides compelling evidence that low levels of vitamin D have a causal role in the development of high blood pressure (hypertension). The findings, published in *The Lancet Diabetes & Endocrinology*, suggest that vitamin D supplementation could be effective in combating some cases of hypertension.

"In view of the costs and side effects associated with antihypertensive drugs, the potential to prevent or reduce blood pressure and therefore the risk of hypertension with vitamin D is very attractive", explains study leader Professor Elina Hyppönen from the University of South Australia.*

There has been considerable interest in the role of vitamin D in hypertension, but until now, a direct causal link has not been shown. Results from observational studies have suggested a strong association

between low vitamin D levels and increases in blood pressure and hypertension, but randomised trials have not provided consistent evidence.

This Mendelian randomisation study used genetic data from the D-CarDia collaboration, involving over 146 500 individuals of European ancestry from across Europe and North America.

Researchers used two common genetic variants that affect circulating 25-hydroxyvitamin D or 25(OH)D concentrations (which are generally used to determine a person's vitamin D status), to measure the causal effect between vitamin D status and blood pressure and hypertension risk. They found that for each 10% increase in 25(OH)D concentration there was a drop in diastolic blood pressure (-0.29 mm Hg) and systolic blood pressure (-0.37 mm Hg), and an 8.1% decrease in the odds of developing hypertension.

According to Professor Hyppönen, "Mendelian randomisation helps to determine cause and effect because by using genetic data we can better avoid confounding, reverse causation, and bias. However, because we cannot exclude the possibility that our findings were caused by chance, they need to be replicated in an independent, similarly powered study. Further studies using randomised controlled trials are also needed to confirm causality and the potential clinical benefits of vitamin D supplementation."*

Writing in a linked Comment, Dr Shoaib Afzal and Dr Børge Nordestgaard from Copenhagen University Hospital and the University of Copenhagen in Denmark say, "Although [this] study is an important step towards delineation of the role of low vitamin D concentrations in the pathogenesis of hypertension, much remains unknown. Confirmation of these results in independent, similarly powered studies will be necessary, as will evidence of a corresponding benefit for the prevention

of diseases caused by hypertension such as stroke. Finally, randomised intervention trials will be needed to determine whether vitamin D supplementation can be used to prevent or treat hypertension before such a strategy can be used clinically."

More information: *The Lancet Diabetes & Endocrinology*, www.thelancet.com/journals/lan … (14)70113-5/abstract

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