Hypertens Res. 2022 Nov;45(11):1814-1822. doi: 10.1038/s41440-022-01004-0. Epub 2022 Sep 5.

Evidence of a casual relationship between vitamin D deficiency and hypertension: a family-based study

Lanxin Bai [1], Chenling Qu [2], Yinhua Feng [1], Gangqiong Liu [3], Xing Li [1], Wenjie Li [1], Songcheng Yu [4] [5]

Affiliations

PMID: 36064589 DOI: 10.1038/s41440-022-01004-0

Abstract

An association between vitamin D deficiency and hypertension has been observed in numerous studies. However, blood pressure improvements resulting from supplementation with vitamin D have been inconsistent. The causal relationship between vitamin D deficiency and hypertension is still unclear and was investigated in this family-based study. A total of 1370 individuals from both vitamin D deficiency and hypertension families were included. First, the heritability of vitamin D deficiency was estimated by the Falconer method. Second, SNPs (single nucleotide polymorphisms) of vitamin D metabolic and functional pathway genes associated with vitamin D deficiency were screened by a family-based association test, and the findings were further verified in nuclear families with vitamin D deficiency. Finally, a family-based association test was applied to investigate the association between selected SNPs associated with vitamin D deficiency and hypertension. The heritability of vitamin D deficiency was 50.4% in this family-based study. Allele C of rs3847987 was a risk factor for vitamin D deficiency (OR: 1.639, 95% CI: 1.170-2.297, P = 0.004). Furthermore, a family-based association of rs3847987 with hypertension was found in both additive and recessive models (P < 0.05). In addition, vitamin D deficiency was associated with hypertension (OR: 1.317, 95% CI: 1.022-1.698, P = 0.033). In conclusion, rs3847987 in the VDR gene was associated with both vitamin D deficiency and hypertension. Therefore, vitamin D deficiency may be a causal factor for hypertension.

Keywords: Family-based association; Heritability; Hypertension; Vitamin D deficiency.

Related information

SNP
SNP (Cited)
Taxonomy via GenBank

LinkOut - more resources

Medical
MedlinePlus Health Information