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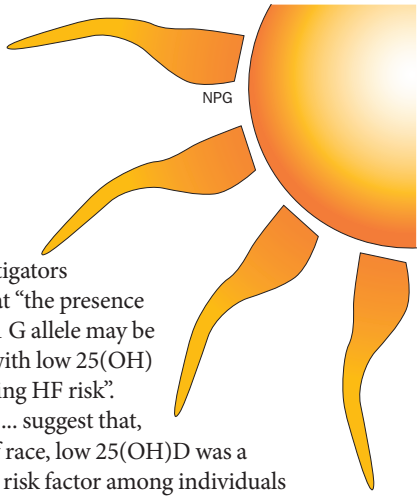

RISK FACTORS

Link between low vitamin D and heart failure

A study of observational data for 12,215 individuals has indicated that an association between low levels of the vitamin D metabolite 25-hydroxyvitamin D (25[OH]D) and heart failure (HF) risk varies by ethnicity. The investigators believe their analysis shows that "variation in bioavailable [vitamin] D may underlie the race interaction observed between 25(OH)D concentration and HF risk".

Vitamin D is mainly obtained by synthesis in the skin in response to sun exposure, but is also obtained from food and supplements. Previous research indicates that black individuals tend to have lower levels of 25(OH)D than white individuals. In this study, median levels of 25(OH)D were 25.6 ng/ml and 18.2 ng/ml, respectively, for the 9,311 white and 2,904 black participants.

Evidence indicates that a low circulating level of 25(OH)D might be associated with increased risk of various cardiovascular diseases, including coronary heart disease and stroke, but that this association might be stronger in white individuals than in black people. Compared with the aforementioned cardiovascular diseases, less is known about a potential link between 25(OH)D levels and risk of HF, and whether ethnicity has any influence on this link. In this new study, no evidence of an association between low 25(OH)D levels and incident HF events (over 21 years) was found among the black participants. By contrast, among the white participants, HF risk seemed to be increased in individuals with 25(OH)D levels <20 ng/ml.

In the single-nucleotide polymorphism rs7041 in vitamin D binding protein, the G allele is known to predispose individuals to higher levels of vitamin D binding protein and, therefore, lower levels of bioavailable vitamin D. The G allele was present in 56% of white participants and 16% of black participants. Among the study cohort, the presence of the G allele seemed to influence the association between low 25(OH)D levels and increased HF risk. The association was not apparent among those with TT alleles, but was robust among those with GG alleles.

The investigators conclude that "the presence of the rs7041 G allele may be synergistic with low 25(OH)D in increasing HF risk". "Our results ... suggest that, regardless of race, low 25(OH)D was a more potent risk factor among individuals genetically predisposed to higher vitamin D binding protein levels, and by extension lower bioavailable vitamin D," write the investigators. They speculate that the observed influence of ethnicity on the association between 25(OH)D levels and HF risk came about because "this allele is less common in blacks, thus predisposing blacks to lower vitamin D binding protein levels and more bioavailable vitamin D relative to whites".

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Original article Lutsey, P. L. *et al.* Race and vitamin D binding protein gene polymorphisms modify the association of 25-hydroxyvitamin D and incident heart failure: the ARIC (Atherosclerosis Risk in Communities) study. *JACC Heart Fail.* doi:10.1016/j.jchf.2014.11.013