# Vitamin D levels have different effects on atherosclerosis in blacks and whites

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Vitamin D is quickly becoming the "go-to" remedy for treating a wide range of illnesses, from osteoporosis to atherosclerosis. However, new evidence from a Wake Forest University School of Medicine study suggests that supplementing vitamin D in those with low levels may have different effects based on patient race and, in black individuals, the supplement could actually do harm.

The study is the first to show a positive relationship between calcified plaque in large arteries, a measure of atherosclerosis or "hardening of the arteries," and circulating vitamin D levels in black patients. It appears in the March issue of the Journal of Clinical Endocrinology and Metabolism.

"In black patients, lower levels of vitamin D may not signify deficiency to the same extent as in whites," said the study's lead investigator, Barry I. Freedman, M.D., John H. Felts III Professor and chief of the section on nephrology at the School of Medicine "We should use caution when supplementing vitamin D in black patients while we investigate if we are actually worsening calcium deposition in the arteries with treatment."

Vitamin D is widely used to treat patients with osteoporosis and/or low vitamin D levels based on a medically accepted normal range. This "normal" range is typically applied to all race groups, although it was established predominantly in whites. It is thought that as low vitamin D levels rise to the normal range with supplementation, protection from bone and heart disease (atherosclerosis) may increase, as well.

Blacks generally have lower vitamin D levels than whites, partly because their darker skin pigmentation limits the amount of the vitamin produced by sunlight. Blacks also consume fewer dairy products and ingest less dietary calcium than whites, said Freedman, an affiliate of the Maya Angelou Center for Health Equity, part of the School of Medicine. Despite these lower vitamin D levels and dietary calcium ingestion, blacks naturally experience lower rates of osteoporosis and have far less calcium in their arteries. Studies further reveal that black patients with diabetes have half the rate of heart attack as whites, when provided equal access to health care. This shows that lower levels of calcified atherosclerotic plaque in blacks are associated with a lower risk of heart disease. However, blacks in the general community have higher rates of heart attack than whites, potentially due to unequal access to medical care, Freedman said.

The research team determined the relationship between circulating vitamin D levels and arterial calcium in 340 black men and women with type 2 diabetes. Calcium can deposit in blood vessel walls forming a bone-like material called "calcified atherosclerotic plaque" and this plaque can be detected by computed tomography (CT) scans. Calcified atherosclerotic plaque is a reliable predictor of risk for heart attack and stroke. The investigators measured vitamin D levels in all study participants and then performed a CT scan to detect calcium in the heart and major arteries.

"We found that higher circulating levels of vitamin D in blacks were associated with more calcium in the artery walls," Freedman said. "This is the opposite effect of what is felt to occur in white patients and shows that the accepted "normal" range of vitamin D may be different between blacks and whites.

"Many of these study patients would be placed on supplemental vitamin D by their physicians simply because their levels were felt to be in the

low range." Freedman added that physicians should use caution in supplementing vitamin D levels in blacks - especially if they do not have weak bones or other reasons to take this vitamin - until the effects of supplementing vitamin D on blood vessels and heart disease are better understood.

"Doctors frequently prescribe supplemental vitamin D," Freedman said. "However, we do not know all of its effects and how they may differ between the races. The bottom line is that racial differences in calcium handling are seen and black and white patients have differing risk for bone and heart disease. We should more clearly determine the effects of supplementing vitamin D in black patients with low levels based on existing criteria and should not assume that the effects of supplementation will be the same between the races."

Provided by Wake Forest University Baptist Medical Center