

# Vitamin D levels linked with health of blood vessels

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A lack of vitamin D, even in generally healthy people, is linked with stiffer arteries and an inability of blood vessels to relax, research from the Emory/Georgia Tech Predictive Health Institute has found.

The results add to evidence that lack of vitamin D can lead to impaired vascular health, contributing to [high blood pressure](#) and the risk of cardiovascular disease. Study participants who increased their vitamin D levels were able to improve vascular health and lower their blood pressure.

The data is being presented on Sunday by Ibhaz Al Mheid, MD, a cardiovascular researcher at Emory University School of Medicine, at the annual American College of Cardiology meeting in New Orleans. Al Mheid is one of five finalists for the ACC's Young Investigators Award competition in physiology, pharmacology and pathology. He is working with Arshed Quyyumi, MD, professor of medicine and director of the Emory Cardiovascular Research Institute.

The 554 participants in the study were Emory or Georgia Tech employees –average age 47 and generally healthy -- who are taking part in the Center for Health Discovery and Well Being, part of the Emory/Georgia Tech Predictive Health Institute.

The average level of 25-hydroxyvitamin D (a stable form of the vitamin reflecting diet as well as production in the skin) in participants' blood was 31.8 nanograms per milliliter. In this group, 14 percent had

25-hydroxyvitamin D levels considered deficient, or less than 20 nanograms per milliliter, and 33 percent had levels considered insufficient, less than 30 nanograms per milliliter.

The researchers monitored the ability of participants' [blood vessels](#) to relax by inflating and then removing a blood pressure cuff on their arms. To allow blood to flow back into the arm, blood vessels must relax and enlarge – a change that can be measured by ultrasound. The researchers also made other measurements of smaller blood vessels and examined the resistance to blood flow imposed by the [arteries](#).

Even after controlling for factors such as age, weight and cholesterol, people with lower vitamin D levels still had stiffer arteries and impaired vascular function, Al Mheid says.

"We found that people with vitamin D deficiency had vascular dysfunction comparable to those with diabetes or hypertension," he says.

Throughout the body, a layer of endothelial cells lines the blood vessels, controlling whether the blood vessels constrict or relax and helping to prevent clots that lead to strokes and heart attacks.

"There is already a lot known about how vitamin D could be acting here," Al Mheid says. "It could be strengthening endothelial cells and the muscles surrounding the blood vessels. It could also be reducing the level of angiotensin, a hormone that drives increased blood pressure, or regulating inflammation."

Most Americans generally get the majority of their vitamin D from exposure to sunlight or from dietary supplements; fortified foods such as milk or cereals are a minor source. A few foods, such as oily fish, naturally contain substantial amounts of vitamin D.

Participants whose vitamin D levels increased over the next six months, either from dietary supplements or ample sun exposure, tended to improve their measures of vascular health and had lower blood pressure. Forty-two study participants with vitamin D insufficiency whose levels later went back to normal had an average drop in blood pressure of 4.6 millimeters mercury.

"This was an observational study, rather than an interventional one, and it was difficult to tease out how the people who restored their vitamin D levels got there," Al Mheid says. "We are hoping to conduct a study where we have participants take a defined regimen of vitamin D."

"With his findings showing the relationship between vitamin D deficiency and vascular dysfunction, Dr. Mheid has helped advance our understanding of the importance of [Vitamin D](#) in preventing a common health problem in aging adults," says Kenneth Brigham, MD, medical director of the Emory/Georgia Tech Center for Health Discovery and Well Being. "Additionally, ongoing health studies based on the Center's collection of health information from participants will yield more discovery as the Center continues to develop."

The Emory-Georgia Tech Predictive Health Institute is a national leader in moving the practice of medicine from a reactive, disease-focused system to a proactive health-focused system. The initiative integrates research, scholarship and education in an innovative effort aimed at revolutionizing care of people to define, preserve and prolong the health of individuals and of society.

Key areas of the Initiative include defining and measuring health using optimal biomarkers of health and understand their interrelationships, determining the best interventions to optimize health throughout an individual's or a population's lifetime.

Provided by Emory University

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