

A little more sunlight for your healthy heart

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Health

Ohio University study shows Vitamin D3 could help heal or prevent cardiovascular damage.

A new study conducted by Ohio University scientists suggests that a little more sunlight might help restore damage to your cardiovascular system.



The study shows that Vitamin D[3] – which is made by the body naturally when skin is exposed to the sun – can significantly restore the damage to the cardiovascular system caused by several diseases, including hypertension, diabetes, and atherosclerosis. Vitamin D[3] supplements are also available over-the-counter.

The study, by Marvin and Ann Dilley White Chair and Distinguished Professor Dr. Tadeusz Malinski and two graduate students, Alamzeb Khan and Hazem Dawoud, has been published in the International Journal of Nanomedicine.

“Generally, Vitamin D[3] is associated with the bones. However, in recent years, in clinical settings, people recognize that many patients who have a heart attack will have a deficiency of D[3]. It doesn’t mean that the deficiency caused the heart attack, but it increased the risk of heart attack,” Malinski said. *“We use nanosensors to see why Vitamin D[3] can be beneficial, especially for the function and restoration of the cardiovascular system.”*

Malinski’s team has developed unique methods and systems of measurements using nanosensors, which are about 1,000 times smaller in diameter than a human hair, to track the impacts of Vitamin D[3] on single endothelial cells, a vital regulatory component of the cardiovascular system. A major discovery from these studies is that vitamin D[3] is a powerful stimulator of nitric oxide (NO), which is a major signaling molecule in the regulation of blood flow and the prevention of the formation of clots in the cardiovascular system. Additionally, vitamin D[3] significantly reduced the level of oxidative stress in the cardiovascular system.

Most importantly, these studies show that treatment with vitamin D[3] can significantly restore the damage to the

cardiovascular system caused by several diseases, including hypertension, atherosclerosis, and diabetes, while also reducing the risk of heart attack. These studies, performed on cells from Caucasian Americans and African Americans, yielded similar results for both ethnic groups.

“There are not many, if any, known systems which can be used to restore cardiovascular endothelial cells which are already damaged, and Vitamin D[3] can do it,” Malinski said. *“This is a very inexpensive solution to repair the cardiovascular system. We don’t have to develop a new drug. We already have it.”*

These studies, performed at Ohio University, are the first to identify the molecular mechanism of vitamin D[3]-triggered restoration of the function of damaged endothelium in the cardiovascular system. While these studies were performed using a cellular model of hypertension, the implication of vitamin D[3] on dysfunctional endothelium is much broader. The dysfunction of endothelium is a common denominator of several cardiovascular diseases, particularly those associated with ischemic events.

Therefore, the authors suggest that vitamin D[3] may be of clinical importance in the restoration of dysfunctional cardiac endothelium after the heart attack, capillary endothelium after brain ischemia (stroke), hypovolemia, vasculopathy, diabetes, and atherosclerosis. This suggestion is strongly supported by several clinical studies which indicate that vitamin D[3] at doses higher than those currently used for the treatment of bone diseases, may be highly beneficial for the treatment of the dysfunctional cardiovascular system.

“Professor Malinski has an international reputation for outstanding and innovative research related to the cardiovascular system,” Ohio University Dean of Arts and Sciences Robert Frank said. *“ This latest work is yet another example of his impact on this field.”*

Malinski’s research on nanomedicine, the development, and application of nanosensors, and nanobiotechnology is published regularly in academic journals, such as Nature, Lancet, Circulation, Diabetes, and Hypertension. In addition to research, Malinski teaches advanced chemistry classes at Ohio University. Malinski has been presented with more than 35 awards and distinctions from around the world. This includes Maria Curie Medal for biomedical research, the Grand Gold Medal in medicine from the French Society of Arts-Science-Letters, and most recently in 2016 the prestigious Albrecht J. Fleckenstein Memorial Award by the International Academy of Cardiology for his contributions to fundamental research in cardiology.

Ohio University

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