

Low vitamin D levels pose large threat to health

August 11 2008

Researchers at Johns Hopkins are reporting what is believed to be the most conclusive evidence to date that inadequate levels of vitamin D, obtained from milk, fortified cereals and exposure to sunlight, lead to substantially increased risk of death.

In a study set to appear in the *Archives of Internal Medicine* online Aug. 11, the Johns Hopkins team analyzed a diverse sample of 13,000 initially healthy men and women participating in an ongoing national health survey and compared the risk of death between those with the lowest blood levels of vitamin D to those with higher amounts. An unhealthy deficiency, experts say, is considered blood levels of 17.8 nanograms per milliliter or lower.

Of the 1,800 study participants known to have died by Dec. 31, 2000, nearly 700 died from some form of heart disease, with 400 of these being deficient in vitamin D. This translates overall to an estimated 26 percent increased risk of any death, though the number of deaths from heart disease alone was not large enough to meet scientific criteria to resolve that it was due to low vitamin D levels.

Yet, researchers say it does highlight a trend, with other studies linking shortages of vitamin D to increased rates of breast cancer and depression in the elderly. And earlier published findings by the team, from the same national study, have established a possible tie-in, showing an 80 percent increased risk of peripheral artery disease from vitamin D deficits.

Researchers note that other studies in the last year or so in animals and humans have identified a connection between low levels of vitamin D and heart disease. But these studies, they say, were weakened by small sample numbers, lack of diversity in the population studied and other factors that limited scientists' ability to generalize the findings to the public at large.

"Our results make it much more clear that all men and women concerned about their overall health should more closely monitor their blood levels of vitamin D, and make sure they have enough," says study co-lead investigator Erin Michos, M.D., M.H.S.

"We think we have additional evidence to consider adding vitamin D deficiency as a distinct and separate risk factor for death from cardiovascular disease, putting it alongside much better known and understood risk factors, such as age, gender, family history, smoking, high blood cholesterol levels, high blood pressure, lack of exercise, obesity and diabetes," says Michos.

Vitamin D is well known to play an essential role in cell growth, in boosting the body's immune system and in strengthening bones.

"Now that we know vitamin D deficiency is a risk factor, we can better assess how aggressively to treat people at risk of heart disease or those who are already ill and undergoing treatment," says Michos, who adds that test screening for nutrient levels is relatively simple. It can, she says, be made part of routine blood work and done while monitoring other known risk factors, including blood pressure, glucose and lipid levels.

Heart disease remains the nation's leading cause of death, killing more than a million Americans each year. Nearly 10 percent of those with the condition have not one identifiable, traditional risk factor, which the experts say is why a considerable extent of the disease goes unexplained.

Michos, an assistant professor at the Johns Hopkins University School of Medicine and its Heart and Vascular Institute, recommends that people boost their vitamin D levels by eating diets rich in such fish as sardines and mackerel, consuming fortified dairy products, taking cod-liver oil and vitamin supplements, and in warmer weather briefly exposing skin to the sun's vitamin-D producing ultraviolet light.

Aware of the cancer risks linked to too much time spent in the sun, she says as little as 10 to 15 minutes of daily exposure to the sun can produce sufficient amounts of vitamin D to sustain health. The hormone-like nutrient controls blood levels of calcium and phosphorus, essential chemicals in the body.

If vitamin supplements are used, Michos says there is no evidence that more than 2,000 international units per day do any good. Study results show that heart disease death rates flattened out in participants with the highest vitamin D levels (above 50 nanograms per milliliter of blood), signaling a possible loss of the vitamin's protective effects at too-high doses.

The U.S. Institute of Medicine suggests that an adequate daily intake of vitamin D is between 200 and 400 international units (or blood levels nearing 30 nanograms per milliliter). Previous results from the same nationwide survey showed that 41 percent of men and 53 percent of women are technically deficient in the nutrient, with vitamin D levels below 28 nanograms per milliliter.

Michal Melamed, M.D., M.H.S., study co-lead investigator who started the research as a clinical fellow at Johns Hopkins, says no one knows yet why or how vitamin D's hormone-like properties may protect the heart, but she adds that there are plenty of leads in the better known links the vitamin has to problems with muscle overgrowth and high blood pressure, in addition to its control of inflammation, which scientists are

showing plays a stronger role in all kinds of heart disease. But more research is needed to determine the nutrient's precise biological action.

Researchers say their next steps are to test various high doses of vitamin D to find out if the nutritional supplementation results in fewer deaths and lower incidence of heart disease, including heart attack or moments of prolonged and severe chest pain.

The team also plans to investigate what biological triggers, such as obesity or hypertension, might offset or worsen the action of vitamin D on heart muscle, or whether vitamin D sets off some other reaction in the heart.

Melamed says that because vitamin D levels are known to fluctuate in direct proportion with daily physical activity, the growing epidemic of obesity and indoor sedentary lifestyles lend more urgency to act on the vitamin D factor.

Source: Johns Hopkins Medical Institutions

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