



Article 31\*

## The Non-Medicated Life: Vitamin D and Cardiovascular Health

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*Editor's Note: Editor's Note: This is the 32nd in a series on optimal diet and lifestyle to help prevent and treat heart disease. Any planned change in diet, exercise or treatment should be discussed with and approved by your personal physician before implementation. The help of a registered dietitian in the implementation of dietary changes is strongly recommended.*

Medicines are a mainstay of American life and the healthcare system not only because they are perceived to work by the individual taking them, but also because their benefit may be shown by the objective assessment of scientific study. Clinical research trials have shown that some of the medicines of Western science may reduce the risk of heart attacks, strokes and cardiovascular death.

In the first 31 installments of The Non-Medicated Life, informed diet and lifestyle have been shown to accomplish naturally for the majority of individuals, many, if not most of the benefits of medications. This also appears to be true for the emerging role of vitamin D in maintaining cardiovascular health.

Over the last several years vitamin D has been recognized not only for its traditional role in maintaining healthy bones, but also for a new role related to immune function and cancer prevention. Indeed, individuals suffering from a deficiency of vitamin D – blood levels less than 20 nanograms per milliliter – face a 30 to 50 percent increased risk of colon, breast and prostate cancers. More recently, a deficiency of vitamin D also appears to predispose to coronary risk factors such as hypertension, metabolic syndrome, diabetes and vascular inflammation as well as increased risk of fatal and nonfatal heart attack, stroke and heart failure.

Most of the data of vitamin D deficiency as it relates to cardiovascular disease is based on epidemiological and observational studies rather than randomized clinical trials. Nevertheless, the data is compelling. In 15,088 participants in the National Health and Nutrition Examination Survey (NHANES III), low vitamin D levels were inversely correlated with hypertension, diabetes, hypertriglyceridemia, and obesity.

In the Framingham Offspring Study 1,739 participants free of cardiovascular disease had a vitamin D level measured at baseline and were then followed for 5.4 years to determine cardiovascular outcome. Fatal or nonfatal heart attack stroke or heart failure was 53 to 80 percent higher in those with low vitamin D levels, especially in those with hypertension. In one study the daily intake of 800 units of vitamin D as compared to less than the recommended daily allowance of 400 units resulted in a 30 percent reduction in the development of diabetes type 2.

In a study of 10,366 Finnish children the daily addition of doses of vitamin D modestly above the recommended daily allowance in the first-year of life reduced the development of type 1 diabetes by 78 percent over 31 years of follow up. Finally, in a meta-analysis of 18 randomized clinical trials made up of 57,000 individuals consistently supplementing the diet with vitamin D slightly above the RDA

reduced all-cause mortality as well as cardiovascular mortality.

The mechanism of this increased cardiovascular risk in vitamin D deficient states is not clear. Low levels of vitamin D are known to increase output of parathyroid hormone, which may increase blood pressure and alter calcium metabolism leading to calcification of the heart valves and possibly blood vessels. It is also known that vitamin D has receptors on a wide range of organs and structures in the body including the cells that line arteries, the smooth muscle cells within arteries which control blood pressure as well as the heart muscle itself. A deficient state thus has the ability to directly affect a wide range of tissues and organs adversely. But what constitutes deficiency and how may one avoid it?

Vitamin D deficiency is defined as a blood level of 25-hydroxy Vitamin D less than 20 nanograms per milliliter. Therefore, a blood test is usually required for a person to know if they are deficient. Blood levels between 20 and 30 nanograms per milliliter are usually defined as insufficient. Blood levels between 30 and 100 are felt to be normal. Blood levels over 100 are toxic and could cause life threatening high calcium.

Unfortunately, recent data suggests that either deficiency or insufficiency may constitute 30 to 50 percent of the population. Since vitamin D is normally obtained from exposure to sunlight those living at northern latitudes have the most deficiency and individuals living above the 35th parallel should discuss blood testing with their physician. Also individuals who are at increased risk for skin cancer and thus avoid sunlight should be tested. Moreover, deficiency may not be avoided even in some of those who take multivitamins containing the recommended daily allowance of vitamin D which is 400 units per day and who eat fortified foods such as milk and orange juice.

Once tested for the blood level of vitamin D, individuals may discuss with their physician

the best means to supplement. In those below 20 nanograms per milliliter, a prescription for eight to ten weeks of high dose oral vitamin D is generally suggested. Once they have had their low level corrected, such individuals may take over the counter oral vitamin D-3 in a dose generally between 800 and 1000 units per day for maintenance with periodic blood tests done to determine specific dose adequacy for an individual.

Sun exposure may increase vitamin D as well. Exposure of the skin surface of head, arms and legs for ten to 15 minutes may produce 3,000 units of vitamin D. However, longer exposure does not increase vitamin D production and will increase the risk for skin cancer. For those with a history of skin cancer or at risk for skin cancer, even such exposure is potentially risky and not needed as all requirement may be met through the use of oral supplements.

In summary, optimizing vitamin D has emerged as a promising new way to reduce cardiovascular risk as well as the risk of colon, breast and prostate cancer. While most of the data for cardiovascular benefit is observational, normalizing deficient blood levels is important for general health and should be done, if for no other reason, to maintain strong bones and teeth. In the process, the use of this natural vitamin may be seen as a way to avoid the proverbial bottle of pills to avoid some of the most serious challenges to heart health.

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