Magnesium and Coronary Artery Calcification

Magnesium is said to figure as one of the greatest predictors of heart disease, and just about all of us are deficient.

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Magnesium plays a key role in more than 350 enzymes and is involved in virtually every metabolic process occurring in the body. As part of a new series, I have decided to focus on a half dozen or such dietary nutrients that play especially vital roles in the physiology of our bodies: magnesium, zinc, B2, 3, 6 and a few others TBD. This week: magnesium

Magnesium and cardiovascular health

Studies have suggested an association between low serum magnesium levels and cardiovascular disease. Low magnesium intake has also been associated with future risk of hypertension and stroke. Furthermore, numerous studies have shown that low serum magnesium is associated with vascular calcification, but there have been no studies examining a relationship to coronary artery calcification.

In a study published in Nutrition, Metabolism & Cardiovascular Diseases, researchers analyzed 34,553 participants who underwent coronary multi-detector computed tomography and serum magnesium level measurement from 2010 to 2012 as part of a health examination program. According to the analysis, low serum magnesium was associated with coronary artery calcification after adjustment for age, sex, BMI, diabetes, hypertension, cardiovascular disease, systolic blood pressure, LDL cholesterol, HDL cholesterol, eGFR, serum calcium and phosphorus, hs-CRP, current smoking status, alcohol intake and vigorous exercise frequency.

Low serum magnesium was significantly associated with coronary artery calcification for those at low risk for developing cardiovascular disease. This association was significant after adjustment for various risk factors related to cardiovascular disease and was even withheld in groups without risk factors such as hypertension, diabetes, and obesity.

Keep in mind that serum magnesium only represents only 1% of magnesium stores. Magnesium is homeostatically controlled in the serum, and measuring serum magnesium levels is not considered to be all that useful. By the time an individual's serum magnesium reads low, s/he is already likely to be deficient, as the body is then showing an inability to maintain the serum levels. Functional medicine, integrative, and other forward looking clinician folks have been measuring

magnesium levels within red blood cells (RBC magnesium) for a while now (which many labs now offer), but my new favorite actually measures magnesium levels within tissues-- via kind of a buccal (inner cheek) swab. This might be the most accurate way of all.

For years and years I watched as my father, thinking he was doing something good for himself, downed calcium supplement after calcium supplement. He insisted on drinking milk daily (fat free, no less!)-- “for my bones.” What neither he nor I really appreciated at the time, though, was that it was really the magnesium (and the vitamin K2, not to mention control of cortisol/Dhea ratios) that he (and we) should have been watching.

As the food in our supermarkets becomes less and less connected to the earth, and our soils depleted, it is said to be more and more difficult to get adequate magnesium from diet alone-- and that if you could take only one supplement, magnesium is probably #1 or #2 on the list.

I take a powdered version called Cenitol, mostly before bed (in 2-4 ounces of water) but sometimes also in the morning if my muscles feel especially tight or I’m feeling unnerved by politics or people. This Metagenics version also contains 4g of inositol (myo-inositol is a sugar common in cantaloupe and oranges and also sometimes thought of as vitamin B8) and can have a surprising effect on bowel motility if you take more than the recommended serving size! Just a little heads up.

In advanced industrialized countries generally, dietary calcium-to-magnesium ratios continue to increase, most likely because folks are making the mistake my father made. But there is more and more evidence that supplementing with calcium without balancing it with magnesium actually contributes to an increase in the risk of heart disease.

Magnesium is also a big player in mood and muscles (twitching, tightness)-- not to mention PMS. More on that in my next post.

About Mike: Michael Barr, DAOM, IFMCP(c) did his acupuncture and Chinese herbal medicine training in Los Angeles and New York and now practices in NY and NJ. More recently he has become involved with the Institute for Functional Medicine. Reach out to him at his new telemedicine platform, Root Resolution Health or for an invitation to his discounted herbal medicine and nutritional supplements dispensary. You might also read more (mostly about acupuncture visits) at his NCCAOM listing here.
