News

Flawed Analysis Misleads Public About Calcium and Heart Attack Risk

The media is at it again — reporting *deceptive* propaganda by the medical establishment as if it were scientific fact.

Just imagine the epidemic of **osteoporosis** that will occur if women stop taking their **calcium** supplements. That will happen if the public relies on mainstream news reporters to make their health decisions.

In a biased and horrifically flawed analysis, a group of doctors came to the conclusion that **calcium supplements** increase **heart attack** risk by **27%**.

Omitted from the media reports were critical facts such as the **exclusion** of people who took **vitamin D**, **magnesium** or other nutrients typically found in bone protection formulations.

In other words, calcium-supplemented study subjects (who the mainstream claims suffered higher heart attack rates) would have been seriously deficient in **vitamin D** and **magnesium** — two essential nutrients that protect against heart attack.

The doctors who compiled this analysis also conveniently omitted major clinical trials showing that those with higher **calcium intake** had significantly lower cardiovascular rates.

A technical rebuttal by Steven Joyal, M.D., to this flawed study appears below. We do want to emphasize, however, the critical need to supplement with other nutrients when taking calcium for optimal effect.

As we age, the body's internal regulators of calcium deposition become ***dysfunctional***. Scientists have uncovered a *deficiency* of **vitamin K** as being a factor that enables calcium to infiltrate the inner lining of arteries to cause arterial calcification. By ensuring optimal **vitamin K** status, calcium is directed to the bone and away from the arterial wall. Fortunately, ***Life Extension®*** members obtain vitamin K in the **Super Booster** multi-nutrient caps as well as **Super K** capsules.

Magnesium is another critical nutrient for bone and cardiovascular health. Of interest, magnesium is considered a natural calcium-channel blocker[17] that supports endothelium-dependent relaxation of blood vessels.[18] For optimal bone and cardiovascular health, nutritional experts for the past 40 years have urged those who take calcium to also supplement with magnesium and vitamin D. ***Life Extension*** members obtain **magnesium** and **vitamin D** in the **Bone Restore** and other bone-support formulas.

Optimal bone health and protection against atherosclerosis requires a multifactorial approach that involves far more than taking *only* calcium. The recently published meta-analysis, flawed as it is, offers a valuable lesson to the serious supplement user, i.e. lack of careful scientific analysis creates seriously flawed conclusions.

Rebuttal to Meta-analysis Claiming that Calcium Increases Myocardial Infarction (heart attack) Risk

By Steven Joyal, M.D.

On July 30, 2010, a meta-analysis published in the *British Journal of Medicine* reported that calcium supplementation was associated with a significant increase in risk for heart attack. Specifically, of the 11 trials included defined by the authors as having "trial level data," the authors reported a **27% increase** in relative risk for heart attack in patients allocated to calcium supplementation (pooled relative risk, 1.27; 95% confidence interval 1.01–1.59, p-value=0.038).

A careful examination of the study methodology reveals several major flaws that severely compromise the authors' conclusions.

In addition, four of the contributing authors of this meta-analysis were involved in pharmaceutical development trials involving calcium supplementation, including Wyeth, Mission Pharmacal, Shire Pharmaceuticals, and Nycomed.

1. **Alarming levels of vitamin D deficiency and exclusion of trial data involving vitamin D3 supplementation in combination with calcium supplementation**

   The study authors indicate that vitamin D3 supplementation reduces mortality,[1] yet excluded trials that used vitamin D3 in combination with calcium supplementation vs. a placebo comparator.

   In fact, vitamin D deficiency has been shown to *increase* cardiovascular risk.[2] Careful review of the 11 studies with trial data included by the authors in the meta-analysis reveals very low levels of 25-hydroxy vitamin D3, ranging from 18.0 to 37.2 ng/mL.

   Based upon the vitamin D insufficiency observed in the trial data included in this meta-analysis, the finding of an increase in heart attack risk is not surprising.

2. **Exclusion of several major trials that showed significant reductions in cardiovascular morbidity and mortality with calcium intake**

   - The Boston nurses health study found that women in the highest fifth for calcium intake from supplements and diet had an adjusted relative risk of ischemic stroke of 0.69 (95% confidence interval 0.50 to 0.95) compared with those in the lowest fifth;[3]
   - The Iowa women's health study found a one-third reduction in deaths from cardiovascular events in women whose calcium intake from supplements and diet was in the highest fourth compared with those in the lowest fourth;[4]
   - The United Kingdom study of ischemic heart disease and calcium intake reported higher calcium intake reduced mortality for ischemic heart disease.[5]

3. **Lack of consistency with other studies showing reduction in biomarkers of cardiovascular risk with calcium supplementation**

   - Calcium supplementation, as well as dietary calcium, reduces blood pressure,[6] a major risk factor for heart attack and stroke;
   - Calcium supplementation increases the ratio of high density lipoprotein (HDL) cholesterol to low density lipoprotein (LDL) cholesterol by almost 20% in healthy postmenopausal women;[7]
   - Calcium supplementation reduces body weight and promotes reductions in blood pressure in aging women.[8]

Given the alarming level of vitamin D deficiency observed in the trial data included in this meta-analysis, the finding of an increase in heart attack risk is not unexpected. Furthermore, exclusion of a variety of calcium trials that show beneficial effects on cardiovascular risk (as well as blood pressure and body weight) suggests author bias.

4. **Lack of appreciation for the critical role of vitamin K in bone and cardiovascular health**

A characteristic of normal aging involves **calcification** in soft tissues throughout the body such as heart and blood vessels.[9-11]

In contrast to the stated conclusion (i.e. calcium supplementation is associated with an increase in heart attack risk) of the current meta-analysis, scientific experiments suggest the *opposite* to be true. For example, in validated models of atherosclerosis, calcium-deficient diets increase the rate of tissue calcification by **170%** while calcium-*supplemented* diets, on the other hand, reduce calcification by **62%**.[12]

The explanation for this apparent contradiction is that in response to insufficient blood levels of calcium, the body robs our bones[13] and, without adequate vitamin K, saturates the *arterial wall* with calcium. In the arterial wall, **vitamin K** regulates a protein (matrix Gla-protein) that protects against **arterial calcification**.

The importance of vitamin K for bone and cardiovascular health was not discussed, acknowledged, or described by the authors in this meta-analysis claiming that calcium increases heart attack risk. Vitamin K is critical to ensure optimal carboxylation of matrix Gla protein (MGP) in healthy subjects. The majority of MGP in the carotid arterial lining of patients with atherosclerosis is undercarboxylated.[14] Serum undercarboxylated MGP is decreased in patients at risk of cardiovascular calcification due to deposition of undercarboxylated MGP in areas of vascular calcification.[15]

Most **Life Extension®** members already obtain high doses of **vitamin K** in the Super Booster or Super K formulas.

Health conscious individuals should make sure they are supplementing with at least 300-500 mg of elemental **magnesium** each day. Some people require higher magnesium intake for optimal tissue saturation. Those with kidney impairment are not always able to safely take higher doses of magnesium.

References

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