

## Do Calcium Supplements Increase Heart Attack Risk?

### Calcium Confusion

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Should you avoid calcium supplements? Do calcium supplements increase heart disease risk? If you've been reading some of the recent headlines in magazines, newspapers and health blogs, that's exactly what you might think.

And, after years of telling us that calcium supplements may be important for bone health, even some doctors are now recommending that their patients avoid calcium supplements. So what's the truth?

What should you believe?

### Calcium Confusion

While some headlines and blogs have been telling you to avoid "killer calcium" supplements at all cost, the actual literature on the subject is much more confusing. Some studies claim that taking over 1,000 mg of supplemental calcium is associated with a slight (20-24%) increase in heart attack risk (Bolland et al, BMJ, 341: c3691, 2010; Bolland et al, BMJ 342: d2040, 2011; Xiao et al, JAMA Internal Medicine, 173: 639-646, 2013). Other studies find no association between supplemental calcium intake and heart attack risk or decreased heart attack risk (Lansetmo et al, J Clin Endocrinol Metab, 98: 3010-3018, 2013; Wang et al, Am J Cardiovasc Drugs, 12:105-116, 2012).

Why the confusion? It turns out that most of these studies had some significant limitations - particularly the studies reporting increased heart attack risk. For example:

- \* Some studies were too small or the follow-up was too short. As a consequence the total number of cardiovascular deaths was so small that it was difficult to have confidence in small differences between the group supplementing with calcium and the one that was not supplementing.
- \* Some of the papers represented a re-analysis of the data from studies that were actually designed to measure whether calcium supplements decreased risk of bone fracture, not whether they increased the risk of cardiovascular death. That is a concern because it means that cardiovascular deaths were not systematically recorded at the time the studies were performed.

And when studies like that are poorly designed, you end up with some pretty bizarre findings. For example:

- \* One study reported that calcium supplementation increased the risk of heart attack only in women who were using no calcium supplements prior to the study. A second study by the same authors reported that calcium supplementation increased heart attack risk only women who were taking calcium supplements prior to the study. Obviously, both studies couldn't be correct.
- \* One study has reported that calcium supplementation increases heart attack risk in women, but

not in men. Another study reports that calcium supplementation increases heart attack risk in men, but not in women. A third study claims that calcium supplementation reduces cardiovascular death in women, but not in men. Again, all of those studies can't be true.

Are you confused yet? If so, I have good news for you. The definitive study on calcium supplements and heart attack risk in humans has just been published.

### Do Calcium Supplements Increase Heart Attack Risk?

A group of scientists from Brigham and Women's Hospital in Boston and Harvard University analyzed the relationship between supplemental calcium use and cardiovascular disease in 74,245 women with no previous history of heart disease who were enrolled in the Nurses' Health Study (Paik et al, Osteoporosis International, doi: 10.1007/s00198-014-2732-2, 2014). This was a very well designed study that avoided the flaws of the previous studies. For example:

- \* There were a large number of women in the study (74,245) and a long follow-up (24 years). As a consequence there were a large number of adverse cardiovascular events (2,709 deaths and 1,856 strokes). This allowed for a very precise statistical comparison of calcium supplement users and non-users.

- \* This study was designed to measure cardiovascular disease and cardiovascular deaths

- \* This study was also designed to measure calcium intake. In fact, calcium intake was measured every 4 years.

The results were pretty clear cut:

- \* Women taking >1,000 mg of supplemental calcium/day had an 18% decrease in cardiovascular deaths.

- \* Women taking >1,000 mg of supplemental calcium/day had a 29% decrease in cardiovascular disease.

- \* When they looked at total calcium intake (dietary and supplemental) women consuming >2,000 mg/day had an 18% decrease in cardiovascular deaths compared to women consuming <500 mg/day (about the average dietary intake for American women).

- \* It didn't make any difference whether the women were at high or low risk of heart disease (smokers versus non-smokers, high blood pressure versus normal blood pressure, high cholesterol versus normal cholesterol, heart healthy diet or poor diet, pre- or post-menopause, etc)

- \* It also didn't make any difference if the women started supplementing with calcium during the last

4 years of the study or had been supplementing with calcium for 24 years. The results were essentially the same.

#### The Bottom Line

- 1) You can ignore the "Killer Calcium" headlines and the warnings that taking calcium supplements will increase your risk of heart disease. The definitive study for women has just been published, and it shows that >1,000 mg/day of supplemental calcium reduces your risk of cardiovascular disease by 29% and cardiovascular death (primarily heart attacks) by 18%.
- 2) The definitive study for men has not yet been published, but it is likely that the results will be similar to those for women.
- 3) On the other hand, there is clear evidence that calcium intake in the 1000 to 1300 mg per day range (the current RDA recommendations) decreases the risk of osteoporosis, and osteoporosis can significantly decrease quality of life and even lead to increased mortality. Most people aren't getting enough calcium in their diet. For these people appropriate calcium supplementation is clearly advantageous.
- 4) Finally, as I discuss in my book "The Myths of the Naysayers" (available for free to subscribers of "Health Tips From the Professor"), some poorly designed calcium supplements could indeed have the potential to increase heart disease risk. My recommendation is to make sure that your calcium supplement contains 800 to 1200 IU of vitamin D per day plus RDA levels of the other nutrients needed for bone formation (vitamin C, vitamin K, magnesium, zinc, copper and manganese).

These statements have not been evaluated by the Food and Drug Administration. This information is not intended to diagnose, treat, cure or prevent any disease.

#### About The Author

Dr. Chaney has a BS in Chemistry from Duke University and a PhD in Biochemistry from UCLA. He is Professor Emeritus from the University of North Carolina where he taught biochemistry and nutrition to medical and dental students for 40 years. Dr. Chaney won numerous teaching awards at UNC, including the Academy of Educators "Excellence in Teaching Lifetime Achievement Award". Dr Chaney also ran an active cancer research program at UNC and published over 100 scientific articles and reviews in peer-reviewed scientific journals. In addition, he authored two chapters on nutrition in one of the leading biochemistry text books for medical students.

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- 2) The definitive study for men has not yet been published, but it is likely that the results will be similar to those for women.
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