

Calcium Supplements – a patient guide.

The use of calcium supplements has long been considered an integral part of managing osteoporosis, with detailed reviews of medical research indicating a reduction in fracture risk when calcium and vitamin D are prescribed. In addition to the bone health benefits, there is also evidence that calcium supplements may improve cholesterol levels, blood pressure, clotting risk and other cardiovascular risk factors. However, a 2008 study from Auckland, New Zealand, designed to assess the efficacy of calcium in preserving bone density and preventing fractures, suggested an increase in cardiovascular events among postmenopausal women taking supplemental calcium citrate. Subsequent studies have produced conflicting results but even a small increase in risk has major public health implications in view of the number of men and women taking calcium supplements.

The controversial Auckland study followed 1471 postmenopausal women with an average age of 74yrs for 5 years¹. At baseline they had a good dietary calcium intake of ~850-860mg daily. Half the group was prescribed calcium citrate in a dose of 1000mg daily and the other half a placebo or dummy pill. Only 58% of the women in the placebo group and 55% in the active treatment group took their medication in a reliable way. The researchers recorded cardiovascular problems reported by the participants and confirmed the information by examining medical records. The results suggested a worse outcome in the calcium treated group. This result was released to the media and it caused significant concern about the safety of taking calcium supplements. This led to a very large (>50%) decrease in the number of men and women taking their calcium supplements. The Auckland group then went on to publish a meta-analysis examining the results of many studies of calcium supplements². They again found a significant cardiovascular risk with the use of calcium supplements. It is important to remember that these studies all involved small numbers of patients and no individual trial showed a clearly increased risk. None were designed specifically to look at cardiovascular problems and much of the cardiovascular information was unpublished which makes it difficult to verify the data.

Since then, there have been numerous studies and a new meta-analysis and the results have been very variable^{3,4,5,6}. Some studies suggest that men and women respond differently to calcium supplements. One small study measuring blood vessel responses to calcium showed improvements that would potentially decrease cardiovascular risk by 30%⁷. The very largest research studies which have looked at women taking both calcium and vitamin D supplements, such as the Women's Health Initiative study of over 36,000 women, have failed to show any risk so it is possible that using vitamin D with calcium modifies any small risk with calcium used alone⁸.

This is a confusing area but we can say that the majority of studies have failed to show any evidence of risk. No study has shown any risk of cardiovascular disease at any level of dietary calcium intake.

The American Association of Clinical Endocrinologists has stated that there is inconsistent evidence for an association between supplemental calcium and cardiovascular disease after reviewing all relevant articles published between 1992 and 2011. Medsafe in New Zealand issued the same advice in late 2013⁹. Osteoporosis experts advise men and women at risk of fractures to adhere to current advice of maintaining a calcium intake of 1000-1300mg/d from diet \pm supplements.

Calcium has a very small effect on reducing fracture risk compared to other medications and it makes sense to obtain this mineral mainly from our diets. Population-wide use of supplements is not recommended because of the lack of evidence that calcium supplements improve health in otherwise fit and healthy individuals.

Take home message

- The majority of studies have failed to show any evidence of increased cardiovascular disease risk with use of calcium supplements. No study has shown any risk at any level of dietary calcium intake.
- Calcium has a very small effect on reducing fracture risk compared to other osteoporosis medications
- It makes sense to obtain this mineral mainly from our diets with a recommended daily intake of 1000-1300mg (<http://www.osteoporosis.org.au/about/about-osteoporosis/calcium/>)

References.

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