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## IADSA SCIENTIFIC RESPONSE- IADSA SCIENTIFIC ALERT SERVICE

**Issue:** **A pooled statistical analysis (meta-analysis) study suggests calcium supplement may increase incidence of heart attack (myocardial infarction) and cardiovascular events**

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**Publication:** **BMJ 2010; 341: c3691**  
**Title:** **Effect of calcium supplements on risk of myocardial infarction and cardiovascular events: meta-analysis**  
**Authors:** **Bolland M, Avenell A, Baron J, et. al.**  
**Publication Date:** **29 July 2010**

### Summary of the study:

Published randomised human studies on calcium supplement were reviewed, and 15 studies were selected and pooled for meta-analysis. The analysis reported a 30% increased likelihood of having a heart attack among people older than 40 who were taking calcium supplements<sup>1</sup>.

### Responses:

1. Calcium is an essential mineral for building and maintaining healthy bone. Calcium supplement plays a key role to complement our diet to meet daily calcium requirement.
2. The report only provides preliminary findings, therefore, intake of calcium supplement by consumers should continue based on current recommendations.
3. In view of the study limitations, particularly none of the original trial was designed to assess cardiovascular primary endpoint, as well as the inherent limitations of meta-analysis, the conclusions linking calcium supplements to heart attacks are overstated.
4. Meta-analysis can be a useful tool for scientific evaluation, but we have to recognize its limitations, and keep in mind that its findings are based on a collection of past studies that may have different designs, doses and study populations,” says Dr. Andrew Shao of Council of Responsible Nutrition. “This analysis should not dissuade consumers, particularly young women, from taking calcium supplements. They should talk with their doctors about their current and long-term needs and determine how

much calcium they are getting from their diets, and supplement accordingly—likely in combination with vitamin D.”

5. There are a number of major shortcomings in the meta-analysis. The 15 trials included in the meta-analysis varied considerably in term of the primary outcome and type of calcium for intervention.
  - The meta-analysis does not reflect the totality of data on calcium supplementation. The studies shortlisted for the statistical meta-analysis were very limited. There were 190 reports being considered for inclusion but only 15 were included in the final analysis.
  - It excluded studies in which participants took both vitamin D and calcium supplements
  - None of the included trials had cardiovascular outcomes as the primary end points. In fact, the 15 pooled studies have a variety of primary endpoints, such as colorectal cancer, bone mineral density at various sites and incidence of fracture.
  - Incomplete or no data on cardiovascular outcomes were available for 7 out of the 15 trials in the meta-analysis, comprising about 15% of the total number of participants in the studies. Furthermore, only 5 of the total 15 studies have all the cardiovascular endpoints.
  - The data on cardiovascular outcomes was not collected in a standardised manner.
  - Known confounding factors associated with risks of heart problems were not adequately accounted for. For instance, information on current smoking status was not available in 5 out of 11 studies tated in Table 2.
  - Different types and dosages of calcium supplement were used among the 15 studies (calcium carbonate, calcium citrate and calcium lactogluconate-carbonate). The doses range from 0.5 to 2 gram
  - The mean baseline dietary calcium intake varied between 406 and 1,240mg a day.
6. The conclusions may not be applicable to other stages of life or in younger women supplementing with calcium to prevent bone loss.
7. Another consideration is if the calcium is taken in divided doses (usual manner) as opposed to all at once. This would avoid any acute spikes in serum calcium. In the report, the participants were 70-79 years old with a total calcium intake of 800 mg with only 1.2% taking any calcium supplements at baseline. This results in a dramatic shift in serum calcium levels at a late stage in life when the kidneys may not be as good at quickly moving calcium from the blood to the cells, which leads to higher serum calcium level.
8. The findings are not consistent with current scientific review and opinion<sup>2,3</sup>.

10 August 2010

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## References

1. Bolland, M, Avenell, A, Baron, J et al. Effect of calcium supplements on risk of myocardial infarction and cardiovascular events: meta-analysis. *BMJ* 2010;341:c3691.
2. Chung M, Balk EM, Brendel M, Ip S, Lau J, Lee J, Lichtenstein A, Patel K, Raman G, Tatsioni A, Terasawa T, Trikalinos TA. Vitamin D and Calcium: A Systematic Review of Health Outcomes. Evidence Report No. 183. (Prepared by the Tufts Evidence-based Practice Center under Contract No. HHSA 290-2007-10055-1.) AHRQ Publication No. 09-E015. Rockville, MD: Agency for Healthcare Research and Quality. August, 2009.  
<http://www.ncbi.nlm.nih.gov/bookshelf/br.fcgi?book=erta183>
3. EFSA Panel on Dietetic Products, Nutrition and Allergies (NDA); Scientific Opinion in relation to the authorisation procedure for health claims on calcium and vitamin D and the reduction of the risk of osteoporotic fractures by reducing bone loss pursuant to Article 14 of Regulation (EC) No 1924/2006. *EFSA Journal* 2010; 8(5):1609.  
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