Increased calcium intake was associated with decreased risk of ischaemic heart disease mortality in postmenopausal women


Question
Is intake of calcium, vitamin D, or milk products associated with ischaemic heart disease (IHD) mortality in postmenopausal women?

Design
Prospective cohort study of women in the Iowa Women’s Health Study with 8 years of follow up.

Setting
Iowa, USA.

Participants
34,486 women who were 55-69 years of age. Women were excluded if they had IHD at baseline, were premenopausal, did not complete at least 30 items on the food frequency questionnaire, or had implausibly high or low daily energy intake scores.

Assessment of risk factors
Women completed postal questionnaires on known and suspected risk factors for cardiovascular disease in 1986. A 127 item semiquantitative food frequency questionnaire measured usual food intake and vitamin and mineral supplement use. For analysis, women were divided into quartiles based on intake of food, nutrients, and other characteristics.

Main outcome measure
Death from IHD (1986–94) obtained from questionnaires and state and national databases.

Main results
During follow up, 387 deaths from IHD occurred (57% from acute myocardial infarction, 30% from chronic IHD, and 13% from arteriosclerotic cardiovascular disease). Multivariate analyses showed that total calcium intake was associated with IHD mortality. Compared with women in the lowest quartile of total calcium intake, those in the second and fourth quartiles had reduced risks of IHD mortality, but those in the third quartile did not (table). A daily intake of 1–500 mg of supplemental calcium was also associated with a reduced risk of IHD (relative risk 0.76, 95% CI 0.58 to 1.00). Dietary calcium; total, dietary, and supplemental vitamin D; and total and fat containing dairy intake were not associated with IHD mortality.

Conclusion
A higher intake of total calcium, but not vitamin D or dairy products, was associated with a decreased risk of ischaemic heart disease mortality in postmenopausal women.

Relative risks for death from ischaemic heart disease for quartiles of total calcium intake in women

<table>
<thead>
<tr>
<th>Quartile</th>
<th>Number of women</th>
<th>Total calcium intake</th>
<th>Relative risk (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>First</td>
<td>127</td>
<td>&lt;696 mg/day</td>
<td>1.00</td>
</tr>
<tr>
<td>Second</td>
<td>84</td>
<td>696–1051 mg/day</td>
<td>0.62 (0.45 to 0.85)</td>
</tr>
<tr>
<td>Third</td>
<td>94</td>
<td>1052–1425 mg/day</td>
<td>0.75 (0.55 to 1.03)</td>
</tr>
<tr>
<td>Fourth</td>
<td>82</td>
<td>1425 mg/day</td>
<td>0.67 (0.47 to 0.94)</td>
</tr>
</tbody>
</table>

*Abbreviations defined in glossary. Analyses adjusted for age, total energy intake, body mass index, waist to hip ratio, history of diabetes mellitus, smoking status, postmenopausal oestrogen use, alcohol intake, educational status, physical activity, dietary vitamin E intake, and saturated fat intake.
†Not significant.

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Commentary
The results of Bostick et al suggest that among postmenopausal women, the risk of dying of IHD may be reduced by consuming relatively high concentrations of calcium. This association seems plausible given the findings of previous research showing that higher consumption of calcium lowers blood cholesterol concentrations, may reduce blood pressure, and may prevent hypertension.

The strengths of this study are that it was prospective and included a large, well-defined cohort derived from a general population. In addition, the validity of the nutritional questionnaire is impressive and well supported by published data. The limitations of the study are the many confounders excluded if they had IHD at baseline, were premenopausal, did not complete ≥30 items on the food frequency questionnaire, or had implausibly high or low daily energy intake scores.

As a source of vitamin D, milk products were not associated with IHD mortality. Furthermore, the findings are consistent with a 30-35% reduction in IHD mortality among postmenopausal women with a high intake of calcium. More studies are needed to substantiate these findings and to clarify practice recommendations, particularly in relation to the non-significant results for the third quartile of calcium intake. Diet and vitamin supplementation should be one of a broader spectrum of lifestyle factors considered for health promotion, disease prevention, and treatment. Studies continue to report that people who have healthy eating habits, exercise more frequently, and do not smoke have better health outcomes. 1

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