Meta-analysis: Calcium supplementation reduces blood pressure and preeclampsia during pregnancy


Objective
To evaluate the effect of calcium supplementation during pregnancy on blood pressure (BP), preeclampsia, and adverse outcomes.

Data sources
Studies were identified by searching the MEDLINE and EMBASE databases using the keywords calcium and hypertension or blood pressure; a Cochrane Collaboration search strategy, developed to enhance retrieval when conducting systematic reviews, was also used. Further searching was done using MEDLINE and EMBASE (1966 to May 1994) with key and text words identified from retrieved citations. Authors of eligible studies were contacted to help identify unpublished trials.

Study selection
Studies were selected if they included pregnant women who were randomised to receive or not receive calcium supplementation and if their BP was measured. Studies were excluded if they had < 2 weeks of intervention or if data from the same patients were included in previous reports.

Data extraction
Extracted data included number of patients, calcium formulation, weeks of gestation, treatment duration, mean change in BP, and incidence of preeclampsia. Reviewers worked independently in pairs while extracting data and assessed the validity of each study according to 6 quality criteria.

Main results
14 trials involving 2459 women met the selection criteria. The pooled analysis of all studies showed a reduction in systolic BP of -5.40 mm Hg (95% CI -7.81 to -3.00 mm Hg, P < 0.001) and in diastolic BP of -3.44 mm Hg (CI -5.20 to -1.68, P < 0.001). In the pooled analysis, strong evidence of heterogeneity existed for both systolic and diastolic BP. For systolic BP, nulliparous status was associated with a treatment effect. For diastolic BP, nulliparous status, multiparous status, and methodologic quality of the study were associated with a treatment effect. Based on the results of 8 studies, the odds ratio (OR) for hypertension in women with calcium supplementation was 0.30 (CI 0.17 to 0.54). The OR for preeclampsia in women with calcium supplementation compared with placebo was 0.38 (CI 0.22 to 0.65). Based on the results of 9 randomised controlled trials included in this systematic review, the lowest control event rate for preeclampsia is 4%. Assuming a patient’s expected event rate of 4%, 41 women (CI 32 to 73) would have to be treated to prevent 1 additional episode of preeclampsia. No statistically significant differences existed between the 2 treatment groups for preterm delivery, intrauterine growth retardation, cesarean section, and perinatal deaths.

Conclusion
Calcium supplementation during pregnancy reduces systolic and diastolic blood pressure and the incidence of preeclampsia and of hypertension. Source of funding: National Dairy Council. For article reprint: Dr. G.H. Guyatt, Department of Clinical Epidemiology and Biostatistics, Room 2C10, McMaster University, 1200 Main Street West, Hamilton, Ontario L8N 3Z5, Canada. FAX 905-577-0017.

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