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Systematic review: Vitamin D and calcium supplementation in prevention of cardiovascular events.

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Abstract

BACKGROUND: Vitamin D and calcium may affect the cardiovascular system independently and interactively.

PURPOSE: To assess whether vitamin D and calcium supplements reduce the risk for cardiovascular events in adults.

DATA SOURCES: Studies published in English from 1966 to July 2009 in MEDLINE, EMBASE, and the Cochrane Central Register of Controlled Trials.

STUDY SELECTION: Two investigators independently selected 17 prospective studies and randomized trials that examined vitamin D supplementation, calcium supplementation, or both and subsequent cardiovascular events.

DATA EXTRACTION: Three investigators extracted and checked data about study designs, participants, exposures or interventions, outcomes, and data quality.

DATA SYNTHESIS: Five prospective studies of patients receiving dialysis and 1 study involving a general population showed consistent reductions in cardiovascular disease (CVD) mortality among adults who received vitamin D supplements. Four prospective studies of initially healthy persons found no differences in incidence of CVD between calcium supplement recipients and nonrecipients. Results of secondary analyses in 8 randomized trials showed a slight but statistically nonsignificant reduction in CVD risk (pooled relative risk, 0.90 [95% CI, 0.77 to 1.05]) with vitamin D supplementation at moderate to high doses (approximately 1000 IU/d) but not with calcium supplementation (pooled relative risk, 1.14 [CI, 0.92 to 1.41]), or a combination of vitamin D and calcium supplementation (pooled relative risk, 1.04 [CI, 0.92 to 1.18]) compared with placebo.

LIMITATIONS: Only articles published in English that reported cardiovascular event outcomes were included. The small number of studies, the lack of trials designed specifically to assess primary effects on cardiovascular outcomes, and important between-study heterogeneity preclude definitive conclusions.

CONCLUSION: Evidence from limited data suggests that vitamin D supplements at moderate to high doses may reduce CVD risk, whereas calcium supplements seem to have minimal cardiovascular effects. Further research is needed to elucidate the role of these supplements in CVD prevention.

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