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Systematic review: Vitamin D and cardiometabolic outcomes.

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Abstract

BACKGROUND: Vitamin D may modify risk for cardiometabolic outcomes (type 2 diabetes, hypertension, or cardiovascular disease).

PURPOSE: To examine the association between vitamin D status, including the effect of vitamin D supplementation, and cardiometabolic outcomes in generally healthy adults.

DATA SOURCES: English-language studies in MEDLINE (inception to 4 November 2009) and the Cochrane Central Register of Controlled Trials (fourth quarter of 2009).

STUDY SELECTION: 11 reviewers screened citations to identify longitudinal cohort studies that reported associations between vitamin D status and cardiometabolic outcomes, including randomized trials of vitamin D supplementation.

DATA EXTRACTION: 5 independent reviewers extracted data about study conduct, participant characteristics, outcomes, and quality. Differences were resolved by consensus.

DATA SYNTHESIS: 13 observational studies (14 cohorts) and 18 trials were eligible. Three of 6 analyses (from 4 different cohorts) reported a lower incident diabetes risk in the highest versus the lowest vitamin D status groups. Eight trials found no effect of vitamin D supplementation on glycemia or incident diabetes. In meta-analysis of 3 cohorts, lower 25-hydroxyvitamin D concentration was associated with incident hypertension (relative risk, 1.8 [95% CI, 1.3 to 2.4]). In meta-analyses of 10 trials, supplementation nonsignificantly reduced systolic blood pressure (weighted mean difference, -1.9 mm Hg [CI, -4.2 to 0.4 mm Hg]) and did not affect diastolic blood pressure (weighted mean difference, -0.1 mm Hg [CI, -0.7 to 0.5 mm Hg]). Lower 25-hydroxyvitamin D concentration was associated with incident cardiovascular disease in 5 of 7 analyses (6 cohorts). Four trials found no effect of supplementation on cardiovascular outcomes.

LIMITATIONS: Studies included primarily white participants. Observational studies were heterogeneous. Several trials reported post hoc analyses.

CONCLUSION: The association between vitamin D status and cardiometabolic outcomes is uncertain. Trials showed no clinically significant effect of vitamin D supplementation at the dosages given.

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