Consumption of nuts and legumes and risk of incidence ischemic heart disease, stroke, and diabetes: a systematic review and meta-analysis.

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Abstract

BACKGROUND: Relations between the consumption of nuts and legumes and risk of ischemic heart disease (IHD), stroke, and diabetes have not been well established.

OBJECTIVE: We systematically investigated and quantified associations of nut and legume consumption with incident IHD, stroke, and diabetes.

DESIGN: We systematically searched multiple databases to identify randomized controlled trials or observational studies that examined the relations. Studies were excluded if they reported only intermediate physiologic measures, soft cardiovascular outcomes, or crude risk estimates. Data were extracted independently and in duplicate. We assessed pooled dose-response relations by using a generalized least-squares trend estimation, and prospective sources of heterogeneity were assessed by using meta-regression. The potential for publication bias was explored by using funnel plots, Begg's and Egger's tests, and Duval and Tweedie trim-and-fill methods.

RESULTS: Of 3851 abstracts, 25 observational studies (23 prospective and 2 retrospective studies) and 2 trial reports met inclusion criteria and comprised 501,791 unique individuals and 11,869 IHD, 6244 stroke, and 14,449 diabetes events. The consumption of nuts was inversely associated with total IHD (6 studies: 6740 events; RR per 4 weekly: 0.79; 95% CI: 0.69, 0.90), nonfatal IHD (4 studies: 2101 events; RR: 0.80; 0.67, 0.95; I2 = 0%), and diabetes (6 studies: 13,316 events; RR: 0.87; 0.81, 0.94; I2 = 0%) but not stroke (4 studies: 5544 events). Legume consumption was inversely associated with total IHD (5 studies: 6014 events; RR per 4 weekly: 0.86; 0.78, 0.94; I2 = 0%) but not significantly associated with stroke (6 studies: 6690 events) or diabetes (2 studies: 2746 events). Meta-regression did not identify the effect modification by age, duration of follow-up, study location, or study quality. Mixed evidence was seen for publication bias, but analyses by using the Duval and Tweedie trim-and-fill method did not appreciably alter results.

CONCLUSION: This systematic review supports inverse associations between eating nuts and incident IHD and diabetes and eating legumes and incident IHD.