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Tea Flavonoids and Risk of Cardiovascular and All-Cause Mortality: A Systematic Review and Meta-Analysis

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Abstract

There is increasing evidence that both black and green tea are beneficial for prevention of cardiovascular disease (CVD). We conducted a systematic review and meta-analysis evaluating the effects of tea flavonoids on cardiovascular (CVD) and all-cause mortality outcomes.Searches across five databases including PubMed and Embase were conducted through November 2018 to identify randomized controlled trials (RCTs) and prospective cohort studies reporting cardiovascular and all-cause mortality outcomes. Two investigators independently conducted abstract and full-text screenings, data extractions, and risk of bias (ROB) assessments using the Nutrition Evidence Library Bias Assessment Tool (NEL BAT). Mixed-effects dose-response meta-regression and standard random-effects meta-analyses for outcomes with ≥ 4 studies were performed. 0 RCTs and 38 prospective cohort studies were included in the systematic review. NEL BAT scores ranged from 0–15 (0 being the lowest risk). Our linear meta-regression model showed that each cup increase in daily tea consumption (about 280 mg and 338 mg of total flavonoids for black and green tea, respectively) was associated with 3–4% lower risk of CVD mortality (predicted adjusted RR = 0.96; CI 0.93–0.99 for green tea and RR = 0.97; CI 0.94–0.99 for black tea). Furthermore, eachcup increase in daily tea consumption was associated a 2% lower risk of all-cause mortality (predicted adjusted relative risk (RR) = 0.98; 95% CI 0.97–0.99 for black tea and RR = 0.98; CI 0.96–0.99 for green tea, respectively). Two studies reported multivariable Cox regression analysis results for the relationship between black tea intake and risks of all-cause mortality outcomes. The results from these two studies were combined with our linear meta-regression result in a random-effects model meta-analysis and showed that each cup increase in daily black tea consumption was associated with an average of 3% lower risk of all-cause mortality (pooled adjusted RR = 0.97; 95% CI 0.87- 1.00) with large heterogeneity ($I^2 = 81.4\%$; p = 0.005). Current evidence indicates that increased tea consumption may reduce cardiovascular and all-cause mortality in a dose-response manner. This systematic review was registered on PROSPERO.

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