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Associations of tea, coffee, and caffeine intake on rheumatoid arthritis risk: A dose-response meta-analysis of cohort studies

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Coffee and tea are two of the most commonly consumed beverages globally. The association of coffee and tea intake with rheumatoid arthritis incidence risk remains uncertain(1). The aim of this study was to examine the potential effect of tea, and coffee intake on risk of RA.

The Medline, Embase, Web of Science, and the Cochrane Library databases were systematically searched for cohort studies of diet and risk of RA. Random effects models were used to calculate pooled effect sizes and 95% confidences intervals for the highest versus lowest categories and to incorporate variation between studies. Linear dose-response meta-analysis was conducted using the method described by Greenland and Longnecker(2). The mean, median, or midpoint values of the upper and lower limits were used to estimated dose amount. When the dose range was open-ended, the width of the adjacent interval was used to estimate dose amount. Potential nonlinear dose-response relation was evaluated using restricted cubic splines with 3 knots at 5%, 50%, and 95% of the distribution of the exposure.

Subgroup analysis were presented to examine possible sources of heterogeneity (when studies ≥ 5). Publication bias was examined by visual inspection of funnel plots as well as Egger's tests. Duval and Tweedie's trim and fill method was used to generate "unbiased" estimates by adding hypothesized studies to make the funnel plot symmetrical. Sensitivity analyses were conducted to test the robustness of the results by excluding 1 study at a time when there were >3 included studies.

Six prospective cohort studies with 3,383 RA cases were included. We found that caffeinated coffee and tea consumption were significantly associated with the risk of RA, and the pooled RR with highest versus lowest comparison was 1.29 (95% CI: 1.03, 1.62; I2 = 0%) and 1.22 (95% CI: 1.11, 1.34; I2 = 58%) respectively. In the linear dose-response analysis, compared to those with no tea consumption, the RRs for consumption of 2 cup/day were 1.04 (95% CI: 1.02, 1.06; I2 = 0%, n = 3 studies) for RA incidence. We did not find significant associations between the risk of RA and the consumption of total coffee, decaffeinated coffee, or caffeine. Furthermore, nonlinear relationships on the risk of RA were not observed for consumption of coffee and tea (all P > 0.05). However, subgroup analysis of total coffee consumption revealed a significant positive association with RA risk in studies conducted in American regions.

Our findings suggest that there is a positive association between tea consumption and an increased risk of RA. Further studies are needed to confirm the potential role of coffee consumption in the prevention of RA.

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References

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