

# **Effects of tocotrienols supplementation on markers of inflammation and oxidative stress: A systematic review and meta-analysis of randomized controlled trials**

## **ABSTRACT**

Studies investigating the effects of tocotrienols on inflammation and oxidative stress have yielded inconsistent results. This systematic review and meta-analysis aimed to evaluate the effects of tocotrienols supplementation on inflammatory and oxidative stress biomarkers. We searched PubMed, Scopus, and Cochrane Central Register of Controlled Trials from inception until 13 July 2020 to identify randomized controlled trials supplementing tocotrienols and reporting circulating inflammatory or oxidative stress outcomes. Weighted mean difference (WMD) and corresponding 95% confidence interval (CI) were determined by pooling eligible studies. Nineteen studies were included for qualitative analysis, and 13 studies were included for the meta-analyses. A significant reduction in C-reactive protein levels (WMD:  $-0.52$  mg/L, 95% CI:  $-0.73$ ,  $-0.32$ ,  $p < 0.001$ ) following tocotrienols supplementation was observed, but this finding was attributed to a single study using  $\delta$ -tocotrienols, not mixed tocotrienols. There were no effects on interleukin-6 (WMD:  $0.03$  pg/mL, 95% CI:  $-1.51$ ,  $1.58$ ,  $p = 0.966$ ), tumor necrosis factor-alpha (WMD:  $-0.28$  pg/mL, 95% CI:  $-1.24$ ,  $0.68$ ,  $p = 0.571$ ), and malondialdehyde (WMD:  $-0.42$   $\mu$ mol/L, 95% CI:  $-1.05$ ,  $0.21$ ,  $p = 0.189$ ). A subgroup analysis suggested that tocotrienols at 400 mg/day might reduce malondialdehyde levels (WMD:  $-0.90$   $\mu$ mol/L, 95% CI:  $-1.20$ ,  $-0.59$ ,  $p < 0.001$ ). Future well-designed studies are warranted to confirm the effects of tocotrienols on inflammatory and oxidative stress biomarkers, particularly on different types and dosages of supplementation. PROSPERO registration number: CRD42020198241.