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Letter to the Editor

No effect of epigallocatechin-3-gallate with weight loss on adiposity reduction, cardiometabolic risk factors and liver function in pre-menopausal obese women

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Mielgo-Ayuso *et al.*[1] conducted a randomised, double-blind, placebo-controlled clinical trial (randomised controlled trial) to investigate the effect of epigallocatechin-3-gallate (EGCG) associated with weight loss on adiposity, cardiometabolic risk factors and liver function. They concluded that there was no advantage or adverse effect of 300 mg/d intake of EGCG for 12 weeks in relation to weight loss on health in pre-menopausal women. I fundamentally agree with the negative data reported in their study outcome; however, two concerns are presented to verify their study data.

The first concern is why they did not check blood pressure during the study. Blood pressure is the core component of cardiometabolic risk factors; for example, Brown *et al.*[2] conducted a randomised controlled trial study in men, aged 40–65 years, and reported that diastolic blood pressure was significantly reduced by the intake of EGCG. Although Mielgo-Ayuso *et al.*[1] selected subjects with blood pressure levels ≤140/90 mmHg, they conducted a strict weight control trial with an energy-restricted diet. This means that blood pressure should be checked as a potential confounder on the result, although their study was conducted in young or middle-aged subjects with normal blood pressure levels. The authors have checked the net effect of EGCG in their randomised controlled trial, but the effect of EGCG on blood pressure was not clarified due to the lack of its monitoring in their study.

The second concern is that there was no significant effect of EGCG on insulin resistance and lipid levels, which is in agreement with the results reported by Brown *et al.*[2], and differences in sex and age did not affect these biomarkers. I recommend that Mielgo-Ayuso *et al.*[1] include dietary factors at baseline in their future study as presented by Brown *et al.*[2]. Lifestyle habits including smoking and alcohol intake differ between men and women, and I speculate that the ethnic difference would partly contribute to the effect of EGCG on health.

Wang *et al.*[3] reported the preventive effect of polyphenols, including green tea catechins, especially EGCG, resveratrol and curcumin, on obesity and obesity-related inflammation by overviewing cellular and animal studies. In contrast, limited human studies have shown inconsistent results, probably because of the difference in study designs and follow-up periods, different individual characteristics such as age, sex and ethnicity, different chemical forms of dietary polyphenols used in each study and insufficient adjustment of confounders relating to weight-associated agents.

Concerning liver dysfunction, Xiao *et al.*[4] reported that EGCG reduced the severity of liver injury in an experimental model of non-alcoholic fatty liver disease associated with lower concentrations of pro-fibrogenic, oxidative stress and pro-inflammatory mediators partly by modulating the activities of transformation growth factor (TGF)/SMAD, phosphoinositide 3-kinase (PI3K)/Akt/forkhead box protein O1 (FoxO1) and NF-κB pathways. These biomarkers should be checked in human studies if EGCG is useful in the prevention of non-alcoholic fatty liver disease.

Anyway, further randomised controlled trial studies are required to confirm the relationship between EGCG and obesity, cardiometabolic risk factors and liver function.

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