ACUTE SUPPLEMENTATION WITH EPIGALLOCATECHIN GALLATE IMPROVES ENDOTHELIAL FUNCTION IN PATIENTS WITH CORONARY ARTERY DISEASE

Coronary artery disease is associated with endothelial dysfunction that may be attributable to oxidative stress and inflammation. Acute consumption of black tea improves endothelium-dependent vasodilation in patients with coronary artery disease, but the specific components responsible for this effect are unknown. Epigallocatechin gallate (EGCG) is an important component of black and green tea and has potent anti-oxidant and anti-inflammatory effects in vitro. To investigate the hypothesis that EGCG contributes to the acute beneficial effects of tea, we completed a double blind, placebo-controlled, crossover study comparing the effects of a single dose of EGCG (300mg) versus placebo with a one-week washout period between treatments in 42 subjects with coronary atherosclerosis. We evaluated brachial artery flow-mediated and nitroglycerin-mediated dilation by ultrasound before and two hours after the dose of EGCG or placebo. Flow-mediated dilation improved from 7.1±4.1 to 8.6±4.7% after the 300mg dose of EGCG (P=0.008). In contrast, flow-mediated dilation was 8.0±4.4 at baseline and remained unchanged after acute placebo (8.6±4.2, P=0.58). Overall, there was a significant effect of treatment on endothelial function that was attributable to an improvement after acute treatment with EGCG (P=0.007 by repeated measures ANOVA). There was no carryover effect. EGCG had no effect on nitroglycerin-mediated dilation or extent of reactive hyperemia. Plasma EGCG levels increased from 2.9±11.4 to 96.5±81.8 ng/ml (mean±SD, P<0.001) after acute EGCG. Thus, acute supplementation with EGCG improves endothelial vasodilator function in patients with coronary artery disease. EGCG could contribute to the beneficial effects of acute tea consumption on endothelial function.