Effects of Black Raspberry on Lipid Profiles, Vascular Endothelial Function and Circulating Endothelial Progenitor Cells in Patients with Metabolic Syndrome

Background: Black raspberry (Rubus occidentalis) has been known for its anti-inflammatory and anti-oxidant effects. However, short-term effects of black raspberry on lipid profiles and vascular endothelial function have not been investigated in patients with metabolic syndrome.  

Methods: Patients with metabolic syndrome (n=77) were prospectively randomized into the black raspberry group (n=39) and placebo group (n=38) during the 12-week follow-up. Dried unripe black raspberries were made into capsules containing black raspberry powder, and black raspberry powder (750mg/day) or placebo was administered for 12 weeks. Lipid profiles, brachial artery flow-mediated dilatation (baFMD) and inflammatory cytokines such as IL-6, TNF-alpha, C-reactive protein, adiponectin, ICAM-1, VCAM-1 were measured at baseline and at 12-week follow-up.  

Results: Baseline patient characteristics such as mean ages and body mass index were similar between the 2 groups. Decreases from baseline in total cholesterol levels (-22.8±30.4mg/dL vs. -1.9±31.8mg/dL, p<0.05, respectively) and total cholesterol/HDL ratio (-0.31±0.64 vs. 0.07±0.58, p<0.05, respectively) were significantly greater in the black raspberry group when compared to the placebo group. Decreases from baseline in IL-6 (-0.4±1.5pg/mL vs. -0.1±1.0pg/mL, p<0.05, respectively) and TNF-alpha levels (-2.9±4.7pg/mL vs. 0.1±3.6pg/mL, p<0.05, respectively) were significantly greater in the black raspberry group when compared to the placebo group. Increases in baFMD at 12-week follow-up were significantly greater in the black raspberry group when compared to the placebo group (3.3±4.4mm vs. 1.0±3.5mm, p<0.05, respectively).  

Conclusions: The use of black raspberry significantly decreased serum total cholesterol levels and inflammatory cytokines, thereby improving vascular endothelial function in patients with metabolic syndrome during the 12-week follow-up.