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Pleiotropic benefit of monomeric and oligomeric flavanols on vascular health - a randomized controlled clinical pilot study.

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Source

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Abstract

BACKGROUND:

Cardiovascular diseases are expanding to a major social-economic burden in the Western World and undermine man's deep desire for healthy ageing. Epidemiological studies suggest that flavanol-rich foods (e.g. grapes, wine, chocolate) sustain cardiovascular health. For an evidenced-based application, however, sound clinical data on their efficacy are strongly demanded.

METHODS:

In a double-blind, randomized, placebo-controlled intervention study we supplemented 28 male smokers with 200 mg per day of monomeric and oligomeric flavanols (MOF) from grape seeds. At baseline, after 4 and 8 weeks we measured macro- and microvascular function and a cluster of systemic biomarkers for major pathological processes occurring in the vasculature: disturbances in lipid metabolism and cellular redox balance, and activation of inflammatory cells and platelets.

RESULTS:

In the MOF group serum total cholesterol and LDL decreased significantly ($P \leq 0.05$) by 5% ($n = 11$) and 7% ($n = 9$), respectively in volunteers with elevated baseline levels. Additionally, after 8 weeks the ratio of glutathione to glutathione disulphide in erythrocytes rose from baseline by 22% ($n = 15$, $P < 0.05$) in MOF supplemented subjects. We also observed that MOF supplementation exerts anti-inflammatory effects in blood towards ex vivo added bacterial endotoxin and significantly reduces expression of inflammatory genes in leukocytes. Conversely, alterations in macro- and microvascular function, platelet aggregation, plasma levels of nitric oxide surrogates, endothelin-1, C-reactive protein, fibrinogen, prostaglandin F₂alpha, plasma antioxidant capacity and gene expression levels of antioxidant defense enzymes did not reach statistical significance after 8 weeks MOF supplementation. However, integrating all measured effects into a global, so-called vascular health index revealed a significant improvement of overall vascular health by MOF compared to placebo ($P \leq 0.05$).

CONCLUSION:

Our integrative multi-biomarker approach unveiled the pleiotropic vascular health benefit of an 8 weeks supplementation with 200 mg/d MOF in humans.

TRIAL REGISTRATION: