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Vascular Medicine

THE IMPACT OF FLAVONOID SUPPLEMENTATION ON ACUTE SMOKING-INDUCED VASCULAR DYSFUNCTION AND INFLAMMATION IN HEALTHY SMOKERS

Poster Contributions
Poster Hall B1
Saturday, March 14, 2015, 10:00 a.m.-10:45 a.m.

Session Title: New Findings in Vascular Inflammation and Endothelial Function
Abstract Category: 45. Vascular Medicine: Non Coronary Arterial Disease
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Background: Smoking is associated with vascular dysfunction and increased inflammatory status. Concord grape juice (CGJ), a rich source of flavonoids, can modify cardiovascular risk factors. Endothelial function and arterial stiffness are surrogate markers of arterial health. We examined the impact of CGJ on endothelial function, arterial stiffness and inflammation in healthy smokers.

Methods: We studied the effect of a 2 weeks oral treatment with CGJ in 26 healthy smokers on three occasions (day 0: baseline, day 7 and day 14) in a randomized, placebo-controlled, double-blind, cross-over design. Measurements were carried out before (pSm), immediately (Sm0) and 20 minutes after (Sm20) cigarette smoking. Endothelial function was evaluated by flow-mediated dilation (FMD) of the brachial artery. Carotid-femoral pulse wave velocity (PWV) was measured as an index of aortic stiffness. Serum levels of intercellular adhesion molecule-1 (sICAM-1) were measured at each study day as an inflammatory marker.

Results: Treatment with CGJ resulted in a significant improvement in FMD (from 8.35±2.83% day 0 to 9.15±4.21% day 7 to 9.49±2.74% day 14, p=0.02) and PWV (from 6.13±0.61m/sec day 0 to 5.86±0.63m/sec day 7 to 5.63±0.56m/sec day 14, p=0.04). Treatment with placebo had no impact on FMD values (p=NS) and PWV (p=NS). Compared to placebo, CGJ treatment prevented the acute smoking induced decrease in FMD in day 7 (p=0.07) and in day 14 (p=0.04). Treatment with CGJ prevented the smoking induced elevation of PWV, after 7 (p=0.055) and 14 (p=0.04) days of treatment. Importantly, treatment with CGJ reduced sICAM-1 levels [from 0.65(0.56-0.86) ng/ml day 0 to 0.50(0.39-0.74)ng/ml day 7 to 0.39(0.26-0.56)ng/ml day 14, p<0.001] while placebo had no impact on ICAM-1 levels [from 0.98(0.69-0.1.39)ng/ml day 0 to 0.96(0.89-0.1.15)ng/ml day 7 to 1.20(0.96-1.52)ng/ml day 14, p<0.10].

Conclusion: CGJ consumption improved endothelial function and vascular elastic properties of the arterial tree during the acute phase of smoking, an effect accompanied by reduced sICAM-1 levels in these subjects.