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MEDICINE SECTION

Specificity of the effect of purple grape juice on endothelial function and lipoproteins in patients with coronary artery disease

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Background and Aim: In vitro, the flavonoid components of red wine and purple grape juice are powerful antioxidants that induce endothelium-dependent vasodilation of vascular rings derived from rat aortas and human coronary arteries. This study assessed the effects of ingesting purple grape juice on endothelial function and low-density lipoprotein susceptibility to oxidation in patients with coronary artery disease.

Methods: Fifteen adults with angiographically documented coronary artery disease ingested $7.7 \pm 1.2 \text{ mL} \cdot \text{kg}^{-1} \cdot \text{d}^{-1}$ of purple grape juice for 14 days. Flow-mediated vasodilation was measured using high-resolution brachial artery ultrasonography. Susceptibility of low-density lipoprotein particles to oxidation was determined from the rate of conjugated diene formation after exposure to copper chloride.

Results: At baseline, flow-mediated vasodilation was impaired ($2.2 \pm 2.9\%$). After ingestion of grape juice, flow-mediated vasodilation increased to $6.4 \pm 4.7\%$ ($P=0.003$). In a linear regression model that included age, artery diameter, lipid values, and use of lipid-lowering and antioxidant therapies, the effect of grape juice on flow-mediated vasodilation remained significant (mean change $4.2 \pm 4.4\%$, $P<0.001$). After ingestion of grape juice, lag time increased by 34.5% ($P=0.015$).

Conclusions: Short-term ingestion of purple grape juice improves flow-mediated vasodilation and reduces low density lipoprotein susceptibility to oxidation in coronary artery disease patients. Improved endothelium-dependent vasodilation and prevention of low-density lipoprotein oxidation are potential mechanisms by which flavonoids in purple grape products may prevent cardiovascular events, independent of alcohol content.