

Abstract

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Beneficial effects of a novel IH636 grape seed proanthocyanidin extract and a niacin-bound chromium in a hamster atherosclerosis model.

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BACKGROUND: Atherosclerosis is a disease of the arteries in which fatty plaques develop on the inner arterial wall, which eventually obstructs blood flow. Identified risk factors for atherosclerosis include genetics, diet, lifestyle, smoking, circulating lipid and cholesterol levels, and molecular and circulating signals of chronic vascular inflammation. The link between flavonoids and atherosclerosis is based partly on the evidence that some flavonoids possess antioxidant properties and have been shown to be potent inhibitors of LDL oxidation in vitro. Hypercholesterolemia, a significant cardiovascular risk factor is prevalent in the American population. Grape seed proanthocyanidin extracts are known to exhibit a broad spectrum of chemopreventive and cardioprotective properties against oxidative stress.

OBJECTIVE: A recent study has shown that a combination of IH636 grape seed proanthocyanidin extract (GSPE) and a niacin-bound chromium (NBC) can decrease total cholesterol, LDL and oxidized LDL levels in hypercholesterolemic human subjects.

METHODS: In this study, we assessed the efficacy of GSPE supplementation in hamsters, singly and in combination with NBC, since these animals have a similar lipid profile to hypercholesterolemic humans when fed a hypercholesterolemic diet of 0.2% cholesterol and 10% coconut oil (HCD).

RESULTS: After 10 weeks of feeding HCD, these animals developed foam cells, which is a biomarker of early stages of atherosclerosis. Atherosclerosis (% of aorta covered with foam cells) was reduced by approximately 50% and 63% following supplementation of these animals with 50 mg/kg and 100 mg/kg of GSPE, respectively, in conjunction with a HCD, while approximately 32% reduction was observed following supplementation of GSPE plus NBC. A range of 7-9 animals was used in each study group. GSPE alone and in combination with NBC exerted a pronounced effect on the cholesterol, and triglyceride levels, as well as oxidative lipid damage as demonstrated by the formation of thiobarbituric acid reactive substances (TBARS).

CONCLUSION: This data demonstrates that GSPE and NBC may provide significant health benefits by dramatically ameliorating the incidence of atherosclerosis as demonstrated by reducing the formation of foam cells.

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