Effects of vitamin C and grape-seed polyphenols on blood pressure in treated hypertensive individuals: results of a randomised double blind, placebo-controlled trial

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Background – Oxidative stress may contribute to the pathogenesis of hypertension and endothelial dysfunction via increased production of free radicals in the arterial wall.

Objective – To investigate the effect of water-soluble antioxidants, vitamin C and polyphenols, on blood pressure (BP), endothelial function and oxidative stress in hypertensive individuals.

Methods – 69 treated hypertensive individuals with a mean 24hr ambulatory systolic BP ≥125 mmHg were involved in a randomised, double blind, placebo-controlled factorial trial. Following a 3-week washout, participants received either 500 mg/d vitamin C, 1000 mg/d grape-seed polyphenols, both vitamin C and polyphenols, or neither, for 6-weeks. At baseline and post-intervention, 24hr ambulatory BP, ultrasound assessed endothelium dependent and independent vasodilation of the brachial artery, and markers of oxidative damage, including plasma and urinary isoprostanes, oxidised low density lipoproteins and plasma tocopherols, were measured.

Results – A significant interaction was observed, therefore results could not be analysed for main effects. In comparison to placebo, vitamin C lowered systolic BP (–1.8±0.8 mmHg, $p=0.03$), polyphenols did not significantly alter BP, but the combination of vitamin C and polyphenols significantly increased systolic (4.8±0.9 mmHg, $p<0.0001$), and diastolic (2.7±0.6 mmHg, $p<0.0001$) BP. Endothelium-dependent and independent vasodilation, and markers of oxidative damage were not significantly altered.

Conclusion – The combination of vitamin C and polyphenols significantly increased BP, but the mechanism remains to be elucidated.