



Anthocyanins attenuate vascular and inflammatory responses to a high fat high energy meal challenge in overweight older adults: A cross-over, randomised, double-blind clinical trial

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Postprandial metabolic imbalances are important indicators of later developing cardiovascular disease (CVD)⁽¹⁾. This study investigated the effects of food anthocyanins on vascular and microvascular function, and CVD associated biomarkers following a high fat high energy (HFHE) meal challenge in overweight older adults. Sixteen subjects (13 female, 3 male, mean age 65.9 SD 6.0 and body mass index 30.6 kg/m² SD 3.9) participated in a crossover, randomised, controlled, double-blind clinical trial (Australian New Zealand Clinical Trials Registry # ACTRN12620000437965). Participants consumed a HFHE breakfast meal (65g total fat; 33g saturated fat) together with a 250 mL dose of either intervention (Queen Garnet Plum providing 201 mg anthocyanins) or control (apricot) juice. A wash-out period of 14 days occurred between meal challenges, with a 4-day run-in period for juice consumption before each challenge. Blood samples and blood pressure measures were collected at baseline, 2 h and 4 h following the HFHE meal. Vascular function, assessed using flow mediated dilatation (FMD), and microvascular cutaneous vascular reactivity, measured using Laser Speckle Contrast Imaging (LSCI), were evaluated at baseline and 2 h after the HFHE meal. Participants had a higher 2 h postprandial FMD (+1.14%) and a higher microvascular post-occlusive reactive hyperaemia (+0.10 perfusion units per mmHg) when allocated to the anthocyanin compared to the control arm (P = 0.019 and P = 0.049, respectively). C-reactive protein was lower 4 h postprandially in the anthocyanins (1.80 mg/L, IQR 0.90) vs control arm (2.30 mg/L, IQR 1.95) (P = 0.026), accompanied by a trend for lower concentrations of interleukin-6 (P = 0.075). No significant postprandial differences were observed between treatments for blood pressure, triacylglycerol, total cholesterol, serum derivatives of reactive oxidative metabolites, tumor necrosis factor α , interleukin-1 β , or maximum microvascular perfusion following iontophoresis of acetylcholine. Fruit-based anthocyanins attenuated the potential postprandial detrimental effects of a HFHE challenge on parameters of vascular and microvascular function, and inflammatory biomarkers in overweight older adults. Anthocyanins may reduce cardiovascular risk associated with endothelial dysfunction and inflammatory responses to a typical high fat 'Western' meal.

Keywords: anthocyanins; postprandial; meal challenge; vascular function

Ethics Declaration

Yes

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Reference

1. Botham KM & Wheeler-Jones CPD (2013) *Prog Lipid Res* 52(4), 446e64.