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Weight loss associated with low-energy diets with different glycaemic loads does not improve arterial stiffness: a randomised clinical trial

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Abstract

We evaluated the effects of two low-energy diets with different glycaemic loads on arterial stiffness in adults with excess weight. This was a 45-day parallel-group, randomised clinical trial including seventy-five participants (20–59 years; BMI 32 kg/m²). They were assigned to two similar low-energy diets (reduction of ~750 kcal.d⁻¹) with macronutrient composition (55 % carbohydrates, 20 % proteins and 25 % lipids) but different glycaemic loads: high-glycaemic load (HGL 171 g.d⁻¹; *n* 36) or low-glycaemic load (LGL 67 g.d⁻¹; *n* 39). We evaluated: arterial stiffness (pulse wave velocity, PWV); augmentation index (Aix@75); reflection coefficient; fasting blood glucose; fasting lipid profile; blood pressure and body composition. We found no improvements in PWV (*P* = 0.690) and Aix@75 (*P* = 0.083) in both diet groups, but there was a decrease in the reflection coefficient in the LGL group (*P* = 0.003) compared with baseline. The LGL diet group showed reductions in body weight (Δ -4.9 kg; *P* = 0.001), BMI (Δ -1.6 kg/m²; *P* = 0.001), waist circumference (Δ -3.1 cm; *P* = 0.001), body fat (Δ -1.8 %; *P* = 0.034), as well as TAG (Δ -14.7 mg/dl; *P* = 0.016) and VLDL (Δ -2.8 mg/dl; *P* = 0.020). The HGL diet group showed a reduction in total cholesterol (Δ -14.6 mg/dl; *P* = 0.001), LDL (Δ -9.3 mg/dl; *P* = 0.029) but a reduction in HDL (Δ -3.7 mg/dl; *P* = 0.002). In conclusion, a 45-day intervention with low-energy HGL or LGL diets in adults with excess weight was not effective to improve arterial stiffness. However, the LGL diet intervention was associated with a reduction of reflection coefficient and improvements in body composition, TAG and VLDL levels.

Keywords

Glycaemic index Glycaemic load Overweight Obesity Pulse wave velocity

Type

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