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Antioxidant vitamins supplementation and arterial stiffness: A systematic review and meta-analysis of randomised controlled trials

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Inflammation and oxidative stress contribute significantly to arterial stiffness⁽¹⁾. Several studies have tested the effects of supplementation with antioxidant vitamins on arterial stiffness (a precursor of cardiovascular diseases) but the results have been contradictory^(2,3). Our objective was to conduct a systematic review and meta-analysis investigating the effect of antioxidant vitamins on arterial stiffness. The second objective was to determine whether the effects on arterial stiffness vary according to dose of antioxidant vitamins, duration of intervention, and health or nutritional status of the included participants.

We searched 3 databases (Medline, Embase and Scopus) for articles with the following criteria: 1) randomized controlled trials comparing antioxidant vitamins (vitamins C, E, A, beta-carotene) with either placebo or no active control; 2) adult participants ≥ 18 years; 3) antioxidant vitamins administered alone or in combination; 4) changes in arterial stiffness or arterial compliance. Data were pooled as standardized mean difference (SMD) and analysed using a fixed effects model.

Pooled analysis (20 studies, 1,909 participants) showed that antioxidant vitamins supplementation reduced arterial stiffness significantly (SMD: -0.17 , 95% CI: -0.26 , -0.08 , $P = 0.0001$). This effect was significant in both experimental and primary prevention studies but not in studies including participants with diseases (SMD: -0.19 , 95% CI: -0.40 , -0.02 , $P = 0.081$). Vitamins supplementation improved arterial stiffness irrespective of age group and duration of intervention. Antioxidant vitamins were more effective in participants with low baseline plasma concentrations of vitamin C and E.

In conclusion, supplementation with antioxidant vitamins has a small, protective effect on arterial stiffness. The effect may be augmented in those with lower baseline plasma vitamin E and C concentrations.

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3. Zureik M, Galan P, Bertrais S et al. (2004). *Arteriosclerosis, Thrombosis & Vascular Biology* **24**, 1485–1491.