

The n-3 fatty acids eicosapentaenoic acid and docosahexaenoic acid increase systemic arterial compliance in humans 1–3

Paul Nestel, Hideki Shige, Sylvia Pomeroy, Marja Cehun, Mavis Abbey, and Daniel Raederstorff

ABSTRACT

Background: n-3 Fatty acids influence vascular function, but the effect of individual fatty acids on systemic arterial compliance (SAC) has not been reported. SAC, which reflects arterial elasticity, is emerging as a new cardiovascular risk factor and appears to predict future cardiovascular events.

Objective: We tested whether the n-3 fatty acids eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) improve SAC in dyslipidemic subjects.

Design: Thirty-eight dyslipidemic subjects were randomly assigned to receive 3 g EPA/d ($n = 12$), 3 g DHA/d ($n = 12$), or a placebo ($n = 14$) in a 7-wk parallel, double-blind trial. Arterial functions were measured at the beginning and end of the interventions. Plasma lipids and plasma fatty acids were also measured.

Results: Consumption of the n-3 fatty acids significantly increased SAC, whereas consumption of the placebo did not ($P = 0.043$; repeated-measures analysis of variance across the 3 groups); the increase was 36% with EPA and 27% with DHA. The major components contributing to the increase in SAC (systolic and pulse pressures and total vascular resistance) tended to decrease but not significantly. Plasma total and VLDL triacylglycerol were significantly lower in the n-3 fatty acid groups ($P = 0.026$ and 0.006 , respectively; repeated-measures analysis of variance) than in the placebo group.

Conclusion: EPA and DHA increase SAC and tend to reduce pulse pressure and total vascular resistance, effects that may reduce the risk of adverse cardiovascular events.

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KEY WORDS Systemic arterial compliance, n3 fatty acids, plasma lipids, arterial pressure, cardiovascular disease, eicosapentaenoic acid, docosahexaenoic acid