

Dose-response effects of omega-3 fatty acids on triglycerides, inflammation, and endothelial function in healthy persons with moderate hypertriglyceridemia

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Abstract

Background: Eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) have been shown to reduce cardiovascular mortality at a dose of ≈ 1 g/d. Studies using higher doses have shown evidence of reduced inflammation and improved endothelial function. Few studies have compared these doses.

Objective: The objective of this study was to compare the effects of a nutritional dose of EPA+DHA (0.85 g/d) with those of a pharmaceutical dose (3.4 g/d) on serum triglycerides, inflammatory markers, and endothelial function in healthy subjects with moderately elevated triglycerides.

Design: This was a placebo-controlled, double-blind, randomized, 3-period crossover trial (8 wk of treatment, 6 wk of washout) that compared the effects of 0.85 and 3.4 g EPA+DHA/d in 23 men and 3 postmenopausal women with moderate hypertriglyceridemia (150–500 mg/dL).

Results: The higher dose of EPA+DHA lowered triglycerides by 27% compared with placebo (mean \pm SEM: 173 ± 17.5 compared with 237 ± 17.5 mg/dL; $P = 0.002$),

whereas no effect of the lower dose was observed on lipids. No effects on cholesterol (total, LDL, and HDL), endothelial function [as assessed by flow-mediated dilation, peripheral arterial tonometry/EndoPAT (Itamar Medical Ltd, Caesarea, Israel), or Doppler measures of hyperemia], inflammatory markers (interleukin-1 β , interleukin-6, tumor necrosis factor- α , and high-sensitivity C-reactive protein), or the expression of inflammatory cytokine genes in isolated lymphocytes were observed.

Conclusion: The higher dose (3.4 g/d) of EPA+DHA significantly lowered triglycerides, but neither dose improved endothelial function or inflammatory status over 8 wk in healthy adults with moderate hypertriglyceridemia.