

Abstract

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Purified eicosapentaenoic and docosahexaenoic acids have differential effects on serum lipids and lipoproteins, LDL particle size, glucose, and insulin in mildly hyperlipidemic men.

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BACKGROUND: Regular consumption of n-3 fatty acids of marine origin can improve serum lipids and reduce cardiovascular risk.

OBJECTIVE: This study aimed to determine whether eicosapentaenoic (EPA) and docosahexaenoic (DHA) acids have differential effects on serum lipids and lipoproteins, glucose, and insulin in humans.

DESIGN: In a double-blind, placebo-controlled trial of parallel design, 59 overweight, nonsmoking, mildly hyperlipidemic men were randomly assigned to receive 4 g purified EPA, DHA, or olive oil (placebo) daily while continuing their usual diets for 6 wk.

RESULTS: Fifty-six men aged 48.8 +/- 1.1 y completed the study. Relative to those in the olive oil group, triacylglycerols fell by 0.45 +/- 0.15 mmol/L (approximately 20%; P = 0.003) in the DHA group and by 0.37 +/- 0.14 mmol/L (approximately 18%; P = 0.012) in the EPA group. Neither EPA nor DHA had any effect on total cholesterol. LDL, HDL, and HDL(2) cholesterol were not affected significantly by EPA, but HDL(3) cholesterol decreased significantly (6.7%; P = 0.032). Although HDL cholesterol was not significantly increased by DHA (3.1%), HDL(2) cholesterol increased by approximately 29% (P = 0.004). DHA increased LDL cholesterol by 8% (P = 0.019). Adjusted LDL particle size increased by 0.25 +/- 0.08 nm (P = 0.002) with DHA but not with EPA. EPA supplementation increased plasma and platelet phospholipid EPA but reduced DHA. DHA supplementation increased DHA and EPA in plasma and platelet phospholipids. Both EPA and DHA increased fasting insulin significantly. EPA, but not DHA, tended to increase fasting glucose, but not significantly so.

CONCLUSIONS: EPA and DHA had differential effects on lipids, fatty acids, and glucose metabolism in overweight men with mild hyperlipidemia.

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