Docosahexaenoic acid supplementation improves fasting and postprandial lipid profiles in hypertriglyceridemic men.

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BACKGROUND: The effects of docosahexaenoic acid (DHA) on the mean size and concentrations of VLDL, LDL, and HDL subclasses have not been previously studied.

OBJECTIVE: We determined the effects of DHA supplementation on the concentrations of apoproteins; large, medium, and small VLDL, LDL, and HDL particles; and the mean diameters of these particles in fasting and postprandial plasma.

DESIGN: Hypertriglyceridemic men aged 39-66 y (n = 34) participated in a double-blind, randomized, placebo-controlled parallel study. They received no supplements for the first 8 d and received either 7.5 g DHA oil/d (3 g DHA/d) or olive oil (placebo) for the last 90 d. Lipoprotein particle diameters and concentrations were measured by nuclear magnetic resonance spectroscopy.

RESULTS: DHA supplementation for 45 d significantly (P < 0.05) decreased concentrations of fasting triacylglycerol (24%), large VLDL (92%), and intermediate-density lipoproteins (53%) and the mean diameter of VLDL particles (11.1 nm). It elevated concentrations of LDL cholesterol (12.6%), small VLDL particles (133%), and large LDL particles (120%) and the mean diameter of LDL particles (0.6 nm) in fasting plasma. Similar changes were observed for area under the curve for postprandial samples (0-6 h); however, the number of small dense LDL particles decreased significantly (21%), and the change in LDL cholesterol was not significant. Continued supplementation with DHA beyond 45 d caused no further changes; placebo treatment altered none of the responses tested.

CONCLUSION: DHA supplementation may improve cardiovascular health by lowering concentrations of triacylglycerols and small, dense LDL particles.

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