

Abstract

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Docosahexaenoic acid supplementation decreases remnant-like particle-cholesterol and increases the (n-3) index in hypertriglyceridemic men.

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BACKGROUND: Plasma remnant-like particle-cholesterol (RLP-C) and the RBC (n-3) index are novel risk factors for cardiovascular disease. Effects of docosahexaenoic acid (DHA) supplementation on these risk factors in hypertriglyceridemic men have not been studied.

OBJECTIVE: We determined effects of DHA supplementation on concentrations of plasma RLP-C, the RBC (n-3) index, and associations between concentrations of plasma RLP-C with those of plasma lipids and fatty acids.

METHODS: Hypertriglyceridemic men aged 39-66 y, participated in a randomized, placebo-controlled, parallel study. They received no supplements for 8 d and then received either 7.5 g/d DHA oil (3 g DHA/d) or olive oil (placebo) for the last 90 d. Fasting blood samples were collected on study d -7, 0 (baseline), 45 (mid-intervention), 84, and 91 (end-intervention).

RESULTS: DHA supplementation for 45 d decreased ($P < 0.05$) fasting RLP-C (36%) and increased plasma eicosapentaenoic acid (EPA):arachidonic acid (AA) (100%) and the RBC (n-3) index (109%). Continued supplementation with DHA between d 45 and 91 further increased the RBC (n-3) index (162%) and plasma EPA:AA (137%) compared with baseline values. RLP-C concentration was positively associated ($P < 0.01$) with the plasma concentrations of triacylglycerols (Kendall's correlation coefficient or $r = 0.46$), triacylglycerol:HDL cholesterol (HDL-C) ($r = 0.44$), total cholesterol:HDL-C ($r = 0.26$), Apo B ($r = 0.22$), C III ($r = 0.41$), and E ($r = 0.17$), and 18:1(n-9) ($r = 0.32$); it was negatively associated ($P < 0.05$) with plasma concentrations of DHA ($r = -0.32$), EPA ($r = -0.25$), HDL-C ($r = -0.21$), LDL cholesterol:Apo B ($r = -0.30$), and HDL-C:Apo A ($r = -0.25$).

CONCLUSIONS: Supplementation with placebo oil did not alter any of the response variables tested. Decreased atherogenic RLP-C and increased cardio-protective (n-3) index may improve cardio-vascular health.

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