

Abstract

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Effect of sex and genotype on cardiovascular biomarker response to fish oils: the FINGEN Study.

Caslake MJ, Miles EA, Kofler BM, Lietz G, Curtis P, Armah CK, Kimber AC, Grew JP, Farrell L, Stannard J, Napper FL, Sala-Vila A, West AL, Mathers JC, Packard C, Williams CM, Calder PC, Minihane AM.

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BACKGROUND: The lipid-modulatory effects of high intakes of the fish-oil fatty acids eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) are well established and likely to contribute to cardioprotective benefits.

OBJECTIVES: We aimed to determine the effect of moderate EPA and DHA intakes (<2 g EPA+DHA/d) on the plasma fatty acid profile, lipid and apolipoprotein concentrations, lipoprotein subclass distribution, and markers of oxidative status. We also aimed to examine the effect of age, sex, and apolipoprotein E (APOE) genotype on the observed responses.

DESIGN: Three hundred twelve adults aged 20-70 y, who were prospectively recruited according to age, sex, and APOE genotype, completed a double-blind placebo-controlled crossover study. Participants consumed control oil, 0.7 g EPA+DHA/d (0.7FO), and 1.8 g EPA+DHA/d (1.8FO) capsules in random order, each for an 8-wk intervention period, separated by 12-wk washout periods.

RESULTS: In the group as a whole, 8% and 11% lower plasma triacylglycerol concentrations were evident after 0.7FO and 1.8FO, respectively ($P < 0.001$): significant sex x treatment ($P = 0.038$) and sex x genotype x treatment ($P = 0.032$) interactions were observed, and the greatest triacylglycerol-lowering responses (reductions of 15% and 23% after 0.7FO and 1.8FO, respectively) were evident in APOE4 men. Furthermore, lower VLDL-cholesterol ($P = 0.026$) and higher LDL-cholesterol ($P = 0.010$), HDL-cholesterol ($P < 0.001$), and HDL2 ($P < 0.001$) concentrations were evident after fish-oil intervention.

CONCLUSIONS: Supplements providing EPA+DHA at doses as low as 0.7 g/d have a significant effect on the plasma lipid profile. The results of the current trial, which used a prospective recruitment approach to examine the responses in population subgroups, are indicative of a greater triacylglycerol-lowering action of long-chain n-3 polyunsaturated fatty acids in males than in females.

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