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Eicosapentaenoic and docosahexaenoic Acid supplementations reduce platelet aggregation and hemostatic markers differentially in men and women.

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Abstract

Although long-chain n3 polyunsaturated fatty acids [n3 PUFAs; eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA)] have been reported to reduce platelet aggregation, the available evidence on this is equivocal. We previously demonstrated that the acute effects of n3 PUFA supplementation on platelet aggregation are sex specific. We aimed to determine if this gender bias is maintained during long-term n3 PUFA supplementation and whether this translates to other hemostatic markers. A double-blinded, randomized, placebo controlled trial was conducted in 94 healthy men and women. Platelet aggregation, thromboxane (TX) B2, P-selectin (P-sel), von Willebrand factor (vWF), and plasminogen activator inhibitor-1 were measured at baseline and 4 wk postsupplementation with EPA-rich (1000 mg EPA:200 mg DHA) or DHA-rich (200 mg EPA:1000 mg DHA) oil capsules daily. The effects of n3 PUFA on platelet activity were compared between men and women. In men and women combined, EPA and DHA reduced platelet aggregation following 4 wk of supplementation relative to placebo (-11.8%, P = 0.016; and -14.8%, P = 0.001, respectively). In subgroup analyses, in men, only the EPA treatment reduced platelet aggregation by -18.4% compared with placebo (P = 0.005) and women (P = 0.011). In contrast, in women, only the DHA treatment reduced platelet aggregation (-18.9%) compared with placebo (P = 0.001) and men (P = 0.017). Significant sex × treatment interactions were also observed on hemostatic markers and uptake of n3 PUFAs. The significant interactions between sex and specific, supplemental, long-chain n3 PUFAs result in platelet aggregation being differentially affected in men and women. With respect to thrombotic disease risk, men are more likely to benefit from supplementation with EPA, whereas women are more responsive to DHA.