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Role of Omega-3 Fatty Acid in Cardiometabolic Risk Reduction

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Abstract

Evidence has supported cardiovascular effects of n-3 polyunsaturated fatty acid (PUFA) consumption, focusing on potential molecular pathways and bioactive metabolites. n-3 PUFA consumption lowers plasma triglycerides, resting heart rate, and blood pressure and might also improve myocardial filling and efficiency, lower inflammation, and improve vascular function. Experimental studies demonstrate direct antiarrhythmic effects, which have been challenging to document in humans. Except coronary heart disease mortality and sudden cardiac death, effects on other cardiovascular outcomes are less-well-established. Current data provide strong concordant evidence that n-3 PUFA are bioactive compounds that reduce risk of cardiac death. Many international guidelines have recommended to consume at least 250 mg/day of long-chain n-3 PUFA or at least 2 servings/week of oily fish.

Icosapent ethyl is a highly purified eicosapentaenoic acid ethyl ester. Recently, a multicenter, randomized, double-blind, placebo-controlled trial involving patients with established cardiovascular disease or with diabetes and other risk factors was performed. They had been receiving statin therapy and who had a fasting triglyceride level of 135 to 499 mg/dL and an LDL-cholesterol level of 41 to 100 mg/dL. The patients were randomly assigned to receive 2 g of icosapent ethyl twice daily (total daily dose, 4 g) or placebo. The primary end point was a composite of cardiovascular death, nonfatal myocardial infarction, nonfatal stroke, coronary revascularization, or unstable angina. A total of 8179 patients were enrolled (70.7% for secondary prevention of cardiovascular events) and were followed for a median of 4.9 years. A primary end-point event occurred in 17.2% of the patients in the icosapent ethyl group, as compared with 22.0% of the patients in the placebo group (hazard ratio, 0.75; 95% CI, 0.68-0.83; P<0.001). Serious bleeding events occurred in 2.7% of the patients in the icosapent ethyl group and in 2.1% in the placebo group (P = 0.06). In conclusion, among patients with high triglyceride levels, the risk of ischemic events, including cardiovascular death, was significantly lower among those who received 2 g of icosapent ethyl twice daily than among those who received placebo. These data suggest positive role of omega-3 fatty acid in cardiometabolic risk reduction.

Keywords

omega-3 fatty acid, cardiovascular disease, triglyceride

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