

Abstract

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Omega-3 fatty acids and coronary heart disease risk: clinical and mechanistic perspectives.

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BACKGROUND: The most common omega-3 fatty acids contain 18-22 carbons and a signature double bond at the third position from the methyl (or n, or omega) end of the molecule. These fatty acids must be obtained in the diet as they cannot be synthesized by vertebrates. They include the plant-derived alpha-linolenic acid (ALA, 18:3n-3), and the fish-oil-derived eicosapentaenoic acid (EPA, 20:5n-3) and docosahexaenoic acid (DHA, 22:6n-3).

DISCUSSION: Normally, very little ALA is converted to EPA, and even less to DHA, and therefore direct intake of the latter two is optimal. EPA and DHA and their metabolites have important biologic functions, including effects on membranes, eicosanoid metabolism, and gene transcription. Studies indicate that the use of fish oil is associated with coronary heart disease risk reduction. A number of mechanisms may be responsible for such effects. These include prevention of arrhythmias as well as lowering heart rate and blood pressure, decreasing platelet aggregation, and lowering triglyceride levels. The latter is accomplished by decreasing the production of hepatic triglycerides and increasing the clearance of plasma triglycerides.

SUMMARY: Our focus is to review the potential mechanisms by which these fatty acids reduce cardiovascular disease risk.

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