

Review: *n*-3 polyunsaturated fatty acids reduce fatal MI, sudden death, and overall mortality in coronary heart disease

Bucher HC, Hengstler P, Schindler C, Meier G. *n*-3 polyunsaturated fatty acids in coronary heart disease: a meta-analysis of randomized controlled trials. *Am J Med.* 2002 Mar;112:298-304.

QUESTION

In patients with coronary heart disease (CHD), is dietary or supplemental intake of *n*-3 polyunsaturated fatty acids more effective than a control diet or placebo for reducing fatal and nonfatal myocardial infarction (MI) and overall mortality?

DATA SOURCES

Studies in any language were identified by searching MEDLINE, EMBASE/Excerpta Medica, Pascal BioMed, and Index Medicus from 1966 to August 1999; by searching the Cochrane Library; and by scanning bibliographies of relevant publications.

STUDY SELECTION

Studies were selected if they were randomized controlled trials (RCTs) that compared dietary or supplemental intake of *n*-3 polyunsaturated fatty acids with a control diet or placebo, reported fatal or nonfatal MI and overall mortality, and followed patients with MI or angiographically established CHD for ≥ 6 months. Studies with angiographic primary end points were eligible if they reported data on MI and mortality. Studies of restricted patients who had had coronary bypass surgery or heart transplantation were excluded.

DATA EXTRACTION

Data were extracted on intervention and control regimens, patients (number; age; his-

tory of MI; treatment with antiplatelet therapy; and total cholesterol, low-density lipoprotein cholesterol, and triglyceride levels), follow-up, study quality, and outcomes. Main outcomes were nonfatal MI, fatal MI, sudden death, and overall mortality.

MAIN RESULTS

11 RCTs ($n = 15\,806$, mean age range 49 to 66 y, mean follow-up 20 mo) met the selection criteria: 2 trials were of dietary intake and 9 were of supplemental intake of *n*-3 polyunsaturated fatty acids. Meta-analysis showed that dietary or supplemental intake of *n*-3 polyunsaturated fatty acids was more effective than a control diet or placebo for reducing fatal MI, sudden death, and overall

mortality (Table). Groups did not differ for nonfatal MI (Table).

CONCLUSIONS

In patients with coronary artery disease, dietary or supplemental intake of *n*-3 polyunsaturated fatty acids reduces fatal myocardial infarction, sudden death, and overall mortality more than a control diet or placebo. Groups do not differ for nonfatal myocardial infarction.

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Dietary or supplemental *n*-3 polyunsaturated fatty acids (*n*-3) vs control diet or placebo (control) in coronary heart disease*

Outcomes at mean 20 mo	Number of trials	Weighted event rates		RRR (95% CI)	NNT (CI)
		<i>n</i> -3	Control		
Nonfatal MI†	9	3.6%	4.3%	20% (-22 to 47)	Not significant
Fatal MI	8	4.5%	5.5%	27% (16 to 36)	96 (63 to 197)
Sudden death	5	2.1%	2.8%	31% (14 to 45)	133 (82 to 345)
Overall mortality	9	8.1%	9.5%	19% (10 to 27)	73 (49 to 147)

*MI = myocardial infarction. Other abbreviations defined in Glossary; RRR, NNT, and CI calculated from meta-analyzed data in article.

†A random-effects model was used because heterogeneity existed.

COMMENTARY

Observational studies have reported an inverse association between fish consumption and risk for CHD. Since the initial reports over 20 years ago, evidence has accumulated that fish oil fatty acids decrease the risk for CHD. In the meta-analysis by Bucher and colleagues, the results from secondary CHD prevention trials analyzing intake of fish, omega-3 fish oil supplements, and α -linolenic acid (a plant-based omega-3 fatty acid) were pooled to estimate the effect of these fatty acids on recurrent CHD events and total mortality. Consumption of omega-3 fatty acids in these trials conferred approximately a 20% to 30% reduction in CHD events and total mortality. Only 1 study examined the effect of α -linolenic acid, which, along with such other dietary changes as increased consumption of fruits, vegetables, and fiber, resulted in a 72% reduction in the risk for nonfatal MI and death from CHD over 46 months of follow-up (1). On average, the magnitude of the reported benefit from the omega-3 fatty acids is similar to that seen from statins. Fish oil fatty acids have beneficial effects on platelet aggregation, lipids, endothelial function, inflammation, and the risk for sudden death.

Current recommendations for nonpregnant healthy adults are to eat ≥ 2 servings of fish per week (2), which may lower the relative risk for CHD by $\geq 50\%$. For patients with known CHD, the daily consumption of fatty fish (e.g., herring, mackerel, and salmon) or approximately 1 g of a fish oil supplement may be recommended to decrease the risk for recurrent events (2).

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