

Review: Increased physical activity and combined dietary changes reduce mortality in coronary artery disease

Iestra JA, Kromhout D, van der Schouw YT, et al. Effect size estimates of lifestyle and dietary changes on all-cause mortality in coronary artery disease patients: a systematic review. *Circulation*. 2005;112:924-34.

Clinical impact ratings: GIM/FP/GP ★★★★★☆☆ Cardiology ★★★★★☆☆

QUESTION

In patients with coronary artery disease (CAD), do lifestyle and dietary changes reduce mortality?

METHODS

Data sources: MEDLINE (1966 to May 2004) and bibliographies of relevant studies. **Study selection and assessment:** Randomized controlled trials (RCTs) or cohort studies in patients $\geq 50\%$ of whom had CAD (history of myocardial infarction [MI] or angina pectoris or previous coronary artery bypass graft or percutaneous transluminal coronary angioplasty) that evaluated ≥ 1 of the following lifestyle or dietary changes: smoking cessation; moderate intensive physical activity; moderate alcohol intake; healthy body weight; limited saturated fat and trans-fatty acid intake; increased intake of fish oil, fruit and vegetables or whole grains, legumes, and nuts; and reduced salt intake. Studies had to have ≥ 6 -month follow-up and assess all-cause mortality. Quality assessment of individual studies included allocation concealment, compliance with the intervention, and study power.

Outcomes: All-cause mortality.

MAIN RESULTS

3 meta-analyses, 10 RCTs, and 9 cohort studies met the selection criteria. The interventions of physical activity, saturated fat reduction, fish (oil) consumption, and combined dietary changes were evaluated in RCTs. A meta-analysis of 12 RCTs showed a 25% relative risk reduction (RRR) in mortality with an exercise-based rehabilitation program (Table). Pooled analysis of 3 RCTs of combined dietary changes (increased intake of fiber-rich food [fruits, vegetables, legumes, and nuts], fish, and unsaturated fatty acid) showed a 45% RRR in mortality (Table). Pooled analysis of saturated fat

reduction (4 RCTs) and regular fish oil consumption (3 RCTs) did not show a reduction in mortality (Table). No RCT evidence existed for smoking cessation or alcohol consumption in CAD.

CONCLUSION

In patients with coronary artery disease, evidence from randomized controlled trials supports increased physical activity and combined dietary changes for reducing mortality.

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Randomized controlled trials (RCTs) of lifestyle and dietary changes to reduce mortality in coronary artery disease*

Interventions	Number of trials (n)	Follow-up (y)	Pooled relative risk (95% CI)
Physical activity	1 meta-analysis (12 RCTs [2585])	2	0.76 (0.59 to 0.98)†
Saturated fat reduction	4 RCTs (3298)	2 to 5	0.98 (0.81 to 1.18)‡§
Regular fish oil consumption	3 RCTs (16 470)	2 to 9	0.88 (0.69 to 1.11)‡§
Combined dietary factors	3 RCTs (2011)	1 to 3.8	0.55 (0.41 to 0.74)†

*CI defined in Glossary.

†A fixed-effects model was used.

‡A random-effects model was used.

§Not significant.

COMMENTARY

The review by Iestra and colleagues on the effects of dietary and lifestyle changes on all-cause mortality in patients with CAD reads like a beautiful short course on the difficulties of making public health guidelines based on evidence from even the best RCTs and cohort studies. The authors examine an irrefutable outcome, all-cause mortality, to determine whether interventions for these high-risk patients are worthwhile.

RCTs support a 25% reduction in mortality from post-MI exercise programs and a 45% reduction from a combination of dietary changes, including increased intake of such fiber-rich foods as fruits, vegetables, nuts, and legumes; fish; and unsaturated fatty acid in oils or special margarines. Only cohort studies (which minimally had to be adjusted for baseline age and sex) were available to support a 20% reduction in mortality from moderate alcohol consumption (2 to 3 drinks/d) and a 25% reduction from smoking cessation.

Neither fish consumption nor fish oil supplementation (up to 1000 mg) showed a beneficial effect on all-cause mortality in patients with CAD. The point estimate was suggestive of benefit, but the confidence interval was wide. This probably reflects the heterogeneity introduced by an RCT in men with angina pectoris in which eating 2 meals of oily fish per week or taking 3 fish-oil capsules per day was associated with a statistically significant 15% increase in CAD mortality (1). Removal of

this study from the analysis of post-MI patients resulted in a 23% reduction in mortality that also agrees with the 20% reduction seen in the cohort studies. Thus, fish oil could be associated with a 20% reduction in death in patients after MI, but the evidence is less than definitive.

Similarly, in RCTs of saturated fat in which far fewer patients were included, no suggestion of benefit was observed. This may reflect the truth, insufficient compliance, the relatively few patients included in the meta-analysis, or a chance occurrence.

The review documents the paucity of evidence from high-quality studies and the limited ability to make public health or clinical recommendations based on all-cause mortality reductions. Nevertheless, the less-than-perfect evidence concerning smoking cessation, post-MI exercise programs, moderate alcohol consumption, and a combination of dietary recommendations is still sufficient to warrant recommending these interventions to our patients with CAD.

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Reference

1. Burr ML, Ashfield-Watt PA, Dunstan FD, et al. Lack of benefit of dietary advice to men with angina: results of a controlled trial. *Eur J Clin Nutr*. 2003;57:193-200.