

Issue 108 In a nutshell

Review of 27 trials of dietary modification of fat intake found that this intervention resulted in only modest reductions of serum cholesterol. The impacts on clinical cardiovascular endpoints were even more modest or non-significant.

It may be that the most effective interventions will prove to be multi-factorial, for example including measures to increase exercise, lower homocysteine etc.

Fat intervention and heart disease

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NUTRITION RESEARCH REVIEW

Study: Meta-analysis of dietary fat modification trials

The combined effect on cardiovascular disease found in 27 trials of dietary fat modification is modest, according to a meta-analysis recently published in the British Medical Journal.

Trials and subjects: The authors searched the medical literature for controlled, randomised trials in which the intervention was a reduction or modification of either fat or cholesterol intake for at least 6 months.

Method: A meta-analysis was performed the main outcomes of which were risk ratios for: total mortality, cardiovascular mortality and cardiovascular events. Meta-regression analysis was used to determine whether the outcomes were better for categories such as: subjects at high initial risk of heart disease, intervention trials using supplementary nutrients (including whole foods), trials varying fatty acid composition etc.

Results: The authors included 27 studies involving 30,902 person-years of observation.

The overall impact of the intervention trials was very modest: see Table.

Table: Meta-analysis of 27 intervention trials involving modification of fat intake

	Rate ratio	95% confidence interval
Total mortality	0.98	0.86 - 1.12
CV mortality		0.91 0.77 - 1.07
CV events	0.84	0.72 - 0.99

The average lowering of serum cholesterol in these trials was 11% from an initial mean cholesterol = 5.8 mmol/l. There was a weak trend towards greater reduction in CV events and mortality in those subjects whose serum cholesterol concentrations were lowered by a larger amount.

The outcome of the meta-analysis did not significantly change when it was confined to trials on subjects at high initial risk. Nor was there any difference found between results based on the different methods used to modify the subjects' diets (i.e. dietary advice vs diet provided vs dietary supplements given).

Reference: Hooper L. et. al. Dietary fat intake and prevention of cardiovascular disease: systematic review. *BMJ* 2001;322:757-763

Comments

The first thing to acknowledge is that most of the longer term (≥ 6 months) dietary interventions reported in this meta-analysis had little impact on heart disease outcomes, with rate ratios whose 95% confidence intervals cross the 'no-effect line' (RR=1.0).

This meta-analysis is one of a number that have been published on this subject. Physicians and nutritionists are making slow progress turning 50 years of extensive research on fat and heart disease into dietary interventions that are demonstrably effective in reducing heart disease mortality or morbidity.

One thing that has become clear from these meta-analyses is that, whilst dietary intervention generally produces modest reductions in blood cholesterol, this does not correlate strongly with clinical outcome. Human metabolism is just too complex for this.

Another thing to note is that only a minority of the trials included in this meta-analysis applied our more sophisticated recent understandings on the impact of different fatty acid types on cardiovascular risk. For example, the different effects of monounsaturated fats, trans and omega-3 fatty acids. The authors of this meta-analysis do point out that the very small number of trials they included which involved monounsaturated fats showed a trend to better results.

Large scale trials on these more sophisticated dietary modifications to fat intake would clearly be valuable. But in the end, it is likely that the most effective interventions will be multifactorial. They will include other dietary factors, such as lowering homocysteine, increasing antioxidants, looking at the role of various whole food such as cereals, making lifestyle changes that will lower obesity and hypertension, and modifying non-dietary lifestyle risk factors such as lack of exercise and stress.

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