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[Intervention Review]

Reduction in saturated fat intake for cardiovascular disease

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ABSTRACT

Background

Reducing saturated fat reduces serum cholesterol, but effects on other intermediate outcomes may be less clear. Additionally it is unclear whether the energy from saturated fats that are lost in the diet are more helpfully replaced by polyunsaturated fats, monounsaturated fats, carbohydrate or protein. This review is part of a series split from and updating an overarching review.

Objectives

To assess the effect of reducing saturated fat intake and replacing it with carbohydrate (CHO), polyunsaturated (PUFA) or monounsaturated fat (MUFA) and/or protein on mortality and cardiovascular morbidity, using all available randomised clinical trials.

Search methods

We updated our searches of the Cochrane Central Register of Controlled Trials (CENTRAL), MEDLINE (Ovid) and EMBASE (Ovid) on 5 March 2014. We also checked references of included studies and reviews.

Selection criteria

Trials fulfilled the following criteria: 1) randomised with appropriate control group; 2) intention to reduce saturated fat intake OR intention to alter dietary fats and achieving a reduction in saturated fat; 3) not multifactorial; 4) adult humans with or without cardiovascular disease (but not acutely ill, pregnant or breastfeeding); 5) intervention at least 24 months; 6) mortality or cardiovascular morbidity data available.

Data collection and analysis

Two review authors working independently extracted participant numbers experiencing health outcomes in each arm, and we performed random-effects meta-analyses, meta-regression, subgrouping, sensitivity analyses and funnel plots.

Main results

We include 15 randomised controlled trials (RCTs) (17 comparisons, ~59,000 participants), which used a variety of interventions from providing all food to advice on how to reduce saturated fat. The included long-term trials suggested that reducing dietary saturated fat reduced the risk of cardiovascular events by 17% (risk ratio (RR) 0.83; 95% confidence interval (CI) 0.72 to 0.96, 13 comparisons, 53,300 participants of whom 8% had a cardiovascular event, I^2 65%, GRADE moderate quality of evidence), but effects on all-cause mortality (RR 0.97; 95% CI 0.90 to 1.05; 12 trials, 55,858 participants) and cardiovascular mortality (RR 0.95; 95% CI 0.80 to 1.12, 12 trials, 53,421 participants) were less clear (both GRADE moderate quality of evidence). There was some evidence that reducing saturated fats reduced the risk of myocardial infarction (fatal and non-fatal, RR 0.90; 95% CI 0.80 to 1.01; 11 trials, 53,167 participants), but evidence for non-fatal myocardial infarction (RR 0.95; 95% CI 0.80 to 1.13; 9 trials, 52,834 participants) was unclear and there were no clear effects on

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stroke (any stroke, RR 1.00; 95% CI 0.89 to 1.12; 8 trials, 50,952 participants). These relationships did not alter with sensitivity analysis. Subgrouping suggested that the reduction in cardiovascular events was seen in studies that primarily replaced saturated fat calories with polyunsaturated fat, and no effects were seen in studies replacing saturated fat with carbohydrate or protein, but effects in studies replacing with monounsaturated fats were unclear (as we located only one small trial). Subgrouping and meta-regression suggested that the degree of reduction in cardiovascular events was related to the degree of reduction of serum total cholesterol, and there were suggestions of greater protection with greater saturated fat reduction or greater increase in polyunsaturated and monounsaturated fats. There was no evidence of harmful effects of reducing saturated fat intakes on cancer mortality, cancer diagnoses or blood pressure, while there was some evidence of improvements in weight and BMI.

Authors' conclusions

The findings of this updated review are suggestive of a small but potentially important reduction in cardiovascular risk on reduction of saturated fat intake. Replacing the energy from saturated fat with polyunsaturated fat appears to be a useful strategy, and replacement with carbohydrate appears less useful, but effects of replacement with monounsaturated fat were unclear due to inclusion of only one small trial. This effect did not appear to alter by study duration, sex or baseline level of cardiovascular risk. Lifestyle advice to all those at risk of cardiovascular disease and to lower risk population groups should continue to include permanent reduction of dietary saturated fat and partial replacement by unsaturated fats. The ideal type of unsaturated fat is unclear.

PLAIN LANGUAGE SUMMARY

Effect of cutting down on the saturated fat we eat on our risk of heart disease

Review question

We wanted to find out the effects on health of cutting down on saturated fat in our food (replacing animal fats with plant oils, unsaturated spreads and more starchy foods).

Background

Health guidance suggests reducing the amount of saturated fat we eat, by cutting down on animal fats, is good for our health. We wanted to combine all available evidence to see whether following this advice leads to a reduced risk of dying or getting cardiovascular disease (heart disease or stroke).

Study characteristics

We assessed the effect of cutting down the amount of saturated fat we eat on health outcomes including dying, heart disease, stroke and cancer for at least two years. We only looked at studies of adults (18 years or older). This included men and women with and without cardiovascular disease. We did not include studies of acutely ill people or pregnant or breastfeeding women.

Key results

We found 15 studies with over 59,000 participants. The evidence is current to March 2014. The review found that cutting down on saturated fat led to a 17% reduction in the risk of cardiovascular disease (including heart disease and strokes), but no effects on the risk of dying. The review found no clear health benefits of replacing saturated fats with starchy foods or protein. Changing the type of fat we eat, replacing saturated fats with polyunsaturated fats, seems to protect us better, reducing our risk of heart and vascular problems. The greater the decrease in saturated fat, and the more serum total cholesterol is reduced, the greater the protection. People who are currently healthy appear to benefit as much as those at increased risk of heart disease or stroke (people with high blood pressure, high serum cholesterol or diabetes, for example), and people who have already had heart disease or stroke. There was no clear difference in effect between men and women.

Quality of the evidence

There is a large body of evidence, including almost 60,000 people who have been in studies assessing effects of reducing saturated fat for at least two years each. Together the studies provide moderate-quality evidence that reducing saturated fat and replacing it with polyunsaturated fats reduces our risk of cardiovascular disease.