DOC news brief
Diabetes, Obesity and Cardiovascular Network

What's Up DOC

News Brief: Saturated fats and heart disease

March 24, 2014

THE STORY

Reality check: All you think you know about fat is wrong
The Globe and Mail, March 19, 2014

Saturated fat alone doesn't predict heart disease
CBC News, March 19, 2014

- There's no clear evidence supporting decades-old dietary guidelines to cut our saturated fat intake to promote heart health, a new review concludes.
- The review includes 45 observational studies and 27 randomized trials on coronary heart disease risks based on diet data from more than 600,000 people in Europe, North America and Asia.

WHERE TO FIND THE RESEARCH

Chowdhury R, Warnakula S, Kunutsor S et al Association of Dietary, Circulating, and Supplement Fatty Acids With Coronary Risk: A Systematic Review and Meta-analysis *Ann Intern Med.* 2014;160(6):398-406-406. doi:10.7326/M13-1788

A CLOSER LOOK AT THE RESEARCH

Purpose: To summarize evidence about associations between fatty acids and coronary disease.

Methods: Electronic searches on MEDLINE, Science Citation Index, and Cochrane Central Register of Controlled trials were conducted to identify studies published before July 1, 2013. In addition, reference list scans through hand-searching of relevant journals and correspondence with study authors were included.

The inclusion criteria for this meta-analysis was quite broad: associations of dietary fatty acid intake, fatty acid biomarkers (measured in whole blood, serum, plasma, circulating fatty acids, or adipose tissue), or fatty acid intervention (dietary or supplements) with risk of coronary disease (defined as fatal or non-fatal MI, CHD, coronary insufficiency, coronary death, angina, angiographic stenosis, or sudden cardiac death).

Observational studies were eligible if they were prospective in design with at least 1 year of follow-up and involved participants from general populations (no pre-existing disease at baseline) or with stable cardiovascular disease at study entry (defined as a diagnosis made at least 30 days before baseline sampling).

Intervention studies were eligible for inclusion if they were randomized and recorded coronary outcomes as an end point of interest.

Two investigators independently extracted data on pre-defined study characteristics. Discrepancies were resolved through discussion and a third reviewer. The quality of the studies and risk of bias were assessed.

Funding was provided by the British Heart Foundation, Medical Research Council, Cambridge National Institute for Health Research Biomedical Research Centre, and Gates Cambridge who had no role in any aspect of the review.

Results: The meta-analysis included 72 unique studies. Nineteen were based in North America, 42 in Europe, and 9 in the Asia-Pacific region; 2 were multinational. There were 45 prospective, observational cohort studies (n=556,246) and 27 randomized, controlled trials (n=103,052). Forty studies were in initially healthy populations, 10 studies had participants with elevated CV risk factors, and 22 studies had CVD at baseline.

Comparing top and bottom thirds of baseline factors:

Fatty Acid	Observational Studies Dietary Fatty Acid Intake Relative Risk Coronary Disease	Observational Studies Circulating Fatty Acid Relative Risk Coronary Disease	Randomized Controlled Trials Relative Risk Coronary Disease
Saturated	1.02 (95% CI, 0.97 to 1.07)	1.06 (CI, 0.86 to 1.30)	
Monounsaturated	0.99 (CI, 0.89 to 1.09)	1.06 (CI, 0.97 to 1.17)	
Alpha-linolenic			0.97 (CI, 0.69 to 1.36)
Long-chain omega-3 PUFA	0.93 (CI, 0.84 to 1.02)	0.84 (CI, 0.63 to 1.11)	0.94 (CI, 0.86 to 1.03)
Omega-6 PUFA	1.01 (CI, 0.96 to 1.07)	0.94 (CI, 0.84 to 1.06)	0.89 (CI, 0.71 to 1.12)
Trans	1.16 (CI, 1.06 to 1.27)	1.05 (CI, 0.76 to 1.44)	

The authors state that their findings do not support cardiovascular guidelines that promote high consumption of long-chain omega-3 and omega-6 polyunsaturated fatty acids and reduced consumption of total saturated fatty acids.

The meta-analysis of randomized trials of long-chain omega-3 and omega-6 polyunsaturated fatty acid supplements suggests that supplementation with these nutrients does not statistically significantly reduce the risk for coronary outcomes. The authors state that further trials are needed because the available evidence is generally limited, especially in initially healthy populations.

The researchers also state a null association between total saturated fatty acids and coronary risk in studies using dietary intake and in those using circulating biomarkers. This could be due to biases in self-reported questionnaires.

In addition, the researchers put forward a possible inverse association between circulating margaric acid (an odd-chain saturated fatty acid that is moderately correlated with milk and dairy fat consumption) and coronary disease. They suggested that odd-chain saturated fats, which reflect milk or dairy consumption, may have less harmful effects on the risk for coronary heart disease.

The analysis suggested no associations of total and individual monounsaturated fatty acids with coronary risk in studies using both dietary intake and circulating fatty acid composition. This is consistent with available mechanistic data, which remain contradictory about whether monounsaturated fatty acids promote or protect against atherogenesis.

Total dietary trans fatty acid intake was positively associated with coronary disease risk in the meta-analysis.

THE BOTTOM LINE

- In this systematic review and meta-analysis of 32 observational studies of dietary fatty acid intake, 17 observational studies of fatty acid biomarkers, and 27 RCTs of fatty acid supplementation the authors conclude that their findings do not support current cardiovascular guidelines that promote high consumption of long-chain omega-3 and omega-6 polyunsaturated fats, and reduced consumption of total saturated fats. They also found a possible inverse association between circulating margaric acid (an odd-chain saturated fatty acid that is moderately correlated with milk and dairy fat consumption) and coronary heart disease.

- Although dietary intake and supplementation of total long-chain omega-3 fatty acids did not have a statistically significant effect on coronary outcomes, it was interesting to note that high circulating levels of eicosapenaenoic acid and docosahexaenoic acid, both individually and combined, did have a statistically significant beneficial effect on coronary outcomes.

- Strengths: data from many different sources; inclusion of a wide range of fatty acids; high number of participants (>600,000) in 18 countries; most of the observational studies were judged as reasonably high quality; all trials had low risk of bias for random-sequence generation and incomplete outcome data domains.

  Limitations: moderate amount of available data on some specific circulating fatty acids and possible overestimations of associations because of preferential publication of extreme findings; selective underreporting may have contributed at least in part to the observational findings; relative risks in the primary data for circulating and dietary fatty acids may have been prone to underestimation because of "regression dilution bias"; inability to adjust consistently for potential confounding factors across all studies; relatively small number of trials investigating alpha-linolenic and omega-6 PUFA interventions; there was questionable or high risk of bias for allocation concealment, blinding of outcome assessment, blinding of participants and personnel, and selective reporting for ~28 trials

- Unfortunately, this review gives newspapers more fodder for turning nutrition guidelines into further skepticism for consumers.

- As dietitians, we can put this in perspective for consumers by helping them move away from focusing on a single macronutrient approach and embracing a whole diet approach with wholesome foods and less processed foods. It is the overall diet quality that is related to health – not one single nutrient. Focusing on single nutrients may only be advantageous to food manufacturers who can fortify minimally nutritious processed foods with 'good' fats or other nutrients giving them a health halo.

- Research on individual nutrients can provide information on the mechanisms of effects, but people eat food—so more food-based research could inform policy recommendations related to reducing CVD that people could actually understand and put into practice.

- To read other comments on this review:
  Marion Nestle: http://www.foodpolitics.com/2014/03/is-saturated-fat-a-problem-food-for-debate/
  David Katz: http://www.huffingtonpost.com/david-katz-md/diet-and-nutrition_b_4985323.html
  Stephan Guyenet: http://wholehealthsource.blogspot.ca/2014/03/new-review-paper-on-dietary-fat-and.html

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