Oily fish and omega 3 fat supplements

Eric Brunner

BMJ 2006;332:739-740; originally published online 24 Mar 2006; doi:10.1136/bmj.38798.680185.47

Updated information and services can be found at:
http://bmj.com/cgi/content/full/332/7544/739

These include:

Data supplement
"Figure"
http://bmj.com/cgi/content/full/332/7544/739/DC1

References
This article cites 9 articles, 5 of which can be accessed free at:
http://bmj.com/cgi/content/full/332/7544/739#BiB1

Rapid responses
10 rapid responses have been posted to this article, which you can access for free at:
http://bmj.com/cgi/content/full/332/7544/739#responses

You can respond to this article at:
http://bmj.com/cgi/eletter-submit/332/7544/739

Email alerting service
Receive free email alerts when new articles cite this article - sign up in the box at the top right corner of the article

Topic collections
Articles on similar topics can be found in the following collections

Environmental Issues (680 articles)
Ischaemic heart disease (1956 articles)
Other nutrition and metabolism (1210 articles)

Notes

To order reprints of this article go to:
http://www.bmjournals.com/cgi/reprintform

To subscribe to BMJ go to:
http://bmj.bmjjournals.com/subscriptions/subscribe.shtml
Seventy five years ago, long chain omega 3 fatty acids were added to the list of essential nutrients. Later in the 20th century, the properties of marine polyunsaturated oils were linked with several health benefits, including protection from cardiovascular disease. However, a high quality systematic review published in this week’s BMJ draws attention to uncertainties about some of the health benefits attributed to omega 3 fats.

The review shows that the evidence for a reduction in cardiovascular events and mortality is less conclusive than we believed. A previous meta-analysis indicates that mortality is reduced owing to fewer fatal coronary events among people ingesting omega 3 fatty acids, but the current review found no strong evidence of a reduction in combined cardiovascular events. The claim that omega 3 fats reduce the risk of cancer is not supported here or by another recent systematic review. For each health outcome there are too few trials with adequate allocation concealment, and too few cohort studies in which the intake of omega 3 fat rather than total fish intake was measured.

Recent findings complicate our understanding of the cardioprotective effect of omega 3 fat. Until the publication of the DART-2 trial in 2003, the evidence showed that omega 3 from oily fish or supplements reduced the risks of fatal myocardial infarction, sudden death, and overall mortality among people with existing disease. DART-2 included 3114 men with stable angina and tested the hypothesis that the main benefit of omega 3 fat is derived from its anti-arrhythmic action in the presence of chronic disease. Surprisingly, DART-2 did not confirm this, showing an excess of sudden and total cardiac deaths. The excess was clearest in participants taking fish oil capsules rather than eating oily fish.

DART-2 is not the only study to show that omega 3 fat supplements have pro-arrhythmic as well as anti-arrhythmic actions. A two year trial randomised 200 participants with an implantable cardioverter defibrillator and a recent episode of ventricular tachycardia or ventricular fibrillation to 1.3 g/day of omega 3 fats or placebo. The supplements did not prevent recurrent arrhythmia and seemed to be pro-arrhythmic in patients with ventricular tachycardia.

Despite the biological plausibility of a generally beneficial anti-arrhythmic effect of omega 3 fats, based on in vitro studies and animal models, it may be wise to make a distinction between patients with chronic disease such as angina and those with acute myocardial infarction, since in the latter the evidence does support early protection against sudden death.

For the general public some omega 3 fat is good for health. Long chain omega 3 fatty acids are structural components of neuronal and other cell membranes, and they modulate the production of eicosanoids and inflammatory cytokines. Whether omega 3 fat prevents cognitive impairment and dementia is currently being tested in trials, with the first results expected in 2008.

Extreme nutritional deficiency of these fats results in a neuropathy that can be reversed with rapeseed oil or other vegetable oils containing α-linolenic acid (18:3 omega 3). α-Linolenic acid is a precursor of long chain omega 3, but endogenous conversion to eicosapentaenoic acid (20:5 omega 3) and docosahexaenoic acid (22:6 omega 3) is limited and inefficient.

Adequate intake of omega 3 fats is particularly important for women of child-bearing age. An estimated 25 g of maternal docosahexaenoic acid is required during pregnancy and lactation to support the development of the fetal and infant brain. Higher maternal intake in pregnancy may also reduce the risk of allergic disease in the offspring, although a study of omega 6:omega 3 fatty acid ratios in umbilical cord blood showed only very weak direct associations with the onset of eczema and wheeze in infants. Women of childbearing age are recommended to eat one or two portions of oily fish per week (about 0.4-0.8 g/day of omega 3 fats) but not more, given hypothetical concerns about toxic contaminants. Dioxins and dioxin-like polychlorinated biphenyls, and methylmercury are linked respectively to cancer and neurological damage but the risk to the child is probably minimal unless there is prolonged high maternal intake.

Women before and during pregnancy and children under 16 are accordingly advised by the UK government to avoid consumption of large predatory fish such as swordfish, which have accumulated a considerable concentration of mercury. For other adults, a maximum of four portions of oily fish per week is advised, including no more than one of swordfish, shark, and the like.

We are faced with a paradox. Health recommendations advise increased consumption of oily fish and fish oils, within limits, on the grounds that intake is generally low. However, industrial fishing has depleted the world’s fish stocks by some 90% since 1950, and rising fish prices reduce affordability particularly for people with low incomes. Global production trends (figure) suggest that, although fish farming is expanding rapidly, we probably do not have a sustainable supply of long chain omega 3 fats.

Eric Brunner reader in epidemiology and public health
(ebrunner@ucl.ac.uk)

UCL Department of Epidemiology and Public Health, Royal Free and University College London Medical School, London WC1E 6BT

Competing interests: None declared.


4 This article was posted on bmj.com on 24 March 2006: http://bmj.com/cgi/doi/10.1136/bmj.38798.680185.47
B etter health care and a reduction in health disparities occur when the physician workforce is diverse in background, ethnicity, culture, and race. Unfortunately, there are not enough students from economically and educationally disadvantaged backgrounds in the pipeline to achieve a sufficiently diverse physician workforce. A paper by Greenhalgh and colleagues in this issue describes an innovative and thoughtful approach of reaching and engaging these students. The project steering group used “partnering” schools and teachers in inner London to identify students from deprived backgrounds who had motivation and ability in the sciences. Teachers reaffirmed the problems the students needed to overcome to be successful in gaining a medical education: lack of self determination, lack of confidence, and lack of information. The group used the summer school programme to target these deficiencies and ignite in the students a sense of purpose and confidence, which was the first step in engaging them in a career in medicine. Interacting with medical students of similar ages and experience increased self confidence and the perception that a career in medicine is possible. Focusing on the deficiencies and lack of confidence, the students had not previously performed well on standardised tests. The success of this programme relies on the academic and personal support the students receive during their premedical and medical education. Despite the obstacles the students face they are able to do the work and achieve careers in medicine.

The challenges of lack of confidence, lack of information and lack of self determination that students encounter in Greenhalgh et al’s experience and ours are important. However, if we are going to successfully address health disparities, programmes like these need to be replicated and applied elsewhere. Also, the authors’ plan to follow up this cohort will be essential to assess the long term impact of this programme. Our societies are becoming more multicultural and diverse. Many of the students in this study were either first generation immigrants or the children of immigrants from 19 countries in Africa, the Caribbean, Asia, and Europe. Understanding the culture, religion, and customs of others is imperative if we are going to live together and reduce health disparities.

Phyllis L Carr  associate dean for student affairs  (pcarr@bu.edu)

Kenneth C Edelin  associate dean for students and minority affairs

Office of Student Affairs, Boston University School of Medicine, Boston, MA 02118, USA

Competing interests: None declared.

3 Greenhalgh T, Russell J, Dunkley L, Boyston PM, Lefford F, Chopra N. “We were treated like adults”—development of a pre-medicine summer school for 16 year olds from deprived socio-economic backgrounds. J R Coll Physicians Lond 1996;30:288-91.