Omega-3 Fatty Acid Intake Lowers Risk for Age-Related Macular Degeneration CME

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Disclosures

Release Date: June 10, 2008; **Valid for credit through June 10, 2009**

Credits Available

Physicians - maximum of 0.25 *AMA PRA Category 1 Credit(s)*™ for physicians;
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June 10, 2008 — Eating fish and other foods high in omega-3 fatty acids is associated with reduced risk for age-related macular degeneration (AMD), according to the results of a study reported in the June issue of the *Archives of Ophthalmology*.

"Epidemiological studies have shown inverse associations, albeit not consistently, between dietary long-chain omega-3 fatty acid and fish intake and AMD risk, write Elaine W.-T. Chong, MBBS, from the University of Melbourne in Melbourne, Australia, and colleagues. "To evaluate these associations further, we performed a systematic review and meta-analysis on dietary omega-3 fatty acid and fish intake in the primary prevention of AMD."

Using standardized criteria and no limits on publication year or language, the reviewers systematically searched 7 databases for randomized controlled trials and prospective cohort, case-control, and cross-sectional studies. Of 2754 abstracts identified, 3 prospective cohort, 3 case-control, and 3 cross-sectional studies met inclusion criteria. Meta-analytic methods allowed quantitative pooling of measures of associations.

Nine studies enrolled a total of 88,974 people, including 3203 cases of AMD. High dietary intake of omega-3 fatty acids was associated with a 38% reduction in the risk for late AMD (pooled odds ratio [OR], 0.62; 95% confidence interval [CI], 0.48 - 0.82). Eating fish at least twice weekly was associated with a decreased risk for both early AMD (pooled OR, 0.76; 95% CI, 0.64 - 0.90) and late AMD (pooled OR, 0.67; 95% CI, 0.53 - 0.85).

Limitations of this review include those inherent in included observational studies, such as possible recall bias and inability to infer temporal associations; possible publication bias; unknown confounders; lack of randomized controlled trials evaluating omega-3 fatty acid and fish intake in the primary prevention of AMD; study samples derived from populations in which participants are well

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Learning Objectives
Upon completion of this activity, participants will be able to:

1. Describe the potential role of dietary omega-3 fatty acids in the prevention of age-related macular degeneration.
2. Evaluate the effects of dietary omega-3 fatty acids and fish intake in the primary prevention of age-related macular degeneration.

Authors and Disclosures

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Disclosure: Laurie Barclay, MD, has disclosed no relevant financial relationships.

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Disclosure: Hien T. Nghiem, MD, has disclosed no relevant financial relationships.

nourished, reducing generalizability; assessment of AMD that varied between studies; and possible misclassification of dietary factors.

"Although this meta-analysis suggests that consumption of fish and foods rich in omega-3 fatty acids may be associated with a lower risk of AMD, there is insufficient evidence from the current literature, with few prospective studies and no randomized clinical trials, to support their routine consumption for AMD prevention," the reviewers write.

A National Health and Medical Research Council Public Health Scholarship to Dr. Chong supported this study in part. Two other reviewers have disclosed various financial relationships with Pfizer and Novartis.

Arch Ophthalmol. 2008;126:826-833.

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AAFP Accreditation Questions

Clinical Context

Among elderly people, AMD is the leading cause of vision loss. Intake of dietary omega-3 fatty acids and fish, the main dietary source of long-chain omega-3 fatty acids, has been suggested to prevent AMD. Fatty acids include alpha-linolenic acid (a short-chain omega-3 fatty acid), docosahexaenoic acid, and eicosapentaenoic acid (both long-chain omega-3 fatty acids). Of particular interest is docosahexaenoic acid, which is an essential structural component of the retinal membranes and is found in the highest concentration per unit area in the retina. In addition, long-chain omega-3 fatty acids are believed to protect against oxygenic, inflammatory, and age-related retinal damage, which are key pathogenic processes in the development of AMD.

The aim of this study was to systematically review the evidence on dietary omega-3 fatty acids and fish intake in the primary prevention of AMD.

Study Highlights

- Up to May 2007, the reviewers systematically searched 7 databases, with no limits on publication year or language and using standardized criteria. Randomized controlled trials and prospective cohort, case-control, and cross-sectional studies were included.
- Of 2754 abstracts identified, 3 prospective cohort, 3 case-control, and 3 cross-sectional studies met the criteria. Not all studies reported both omega-3 fatty acid and fish intake.
- No randomized controlled trials met the inclusion criteria.
- Measures of associations were pooled quantitatively with use of meta-analytic methods.
- 2 primary outcomes were evaluated: early AMD (defined as soft drusen or retinal pigmentary changes) and late AMD (exudative AMD or geographic atrophy).
- 9 studies provided data on a total sample of 88,974 people, including 3203 AMD cases (1847 early and 1356 late AMD cases).
- The results evaluating the association of omega-3 fatty acids and early AMD were not pooled; however, 2 prospective cohort studies, the Blue Mountains Eye Study and the Nurses' Health Study and the Health Professional Follow-Up Study, were consistent with a protective effect of omega-3 fatty acids against early AMD.
- A high dietary intake of omega-3 fatty acids was associated with a 38% reduction in the risk for late AMD (pooled OR, 0.62; 95% CI, 0.48 - 0.82).
- Fish intake at least twice a week was associated with a reduced risk for both early AMD (pooled OR, 0.76; 95% CI, 0.64 - 0.90) and late AMD (pooled OR, 0.67; 95% CI, 0.53 - 0.85).
- Limitations of this study included the following: no randomized controlled trials were included in evaluating omega-3 fatty acid and fish intake in the primary prevention of AMD; meta-analyses of observational data are known to have more biases than meta-analyses of randomized controlled trials, particularly prone to recall bias and temporal relationships between diet and disease; associations between AMD prevention and omega-3 fatty acid or fish intake may reflect other broader aspects of diet or lifestyle; the results could not be applied to all populations because the populations included in the studies were well nourished; the assessment of AMD varied between studies; and misclassification of dietary factors could have occurred.

Pearls for Practice

- Long-chain omega-3 fatty acids are believed to protect against oxygenic, inflammatory, and

age-related retinal damage, which are key pathogenic processes in the development of AMD.

- This meta-analysis suggests that consumption of fish and foods rich in omega-3 fatty acids may be associated with a lower risk for AMD; however, there was insufficient evidence with few prospective studies and no randomized clinical trials to support their routine consumption for the prevention of AMD.

CME / CE Test

Questions answered incorrectly will be highlighted.

Which of the following *most* likely protects against key pathogenic processes in the development of AMD?

- Alpha-linolenic acid
- Docosahexaenoic acid
- Eicosapentaenoic acid
- Both docosahexaenoic and eicosapentaenoic acids

In the review and meta-analysis by Chong and colleagues, which of the following statements regarding dietary omega-3 fatty acid and fish intake in the primary prevention of AMD is *not* correct?

- A high dietary intake of omega-3 fatty acids was associated with a 38% reduction in the risk for early AMD
- Fish intake at least twice a week was associated with a reduced risk for early AMD
- Two prospective cohort studies demonstrated a protective effect of omega-3 fatty acids against early AMD
- Fish intake at least twice a week was associated with a reduced risk for late AMD

Save and Proceed