Objective
To evaluate the association of lipid intake with baseline severity of age-related macular degeneration (AMD) in the Age-Related Eye Disease Study (AREDS).

Methods
Age-Related Eye Disease Study participants aged 60 to 80 years at enrollment (N = 4,519) provided estimates of habitual nutrient intake through a self-administered semiquantitative food frequency questionnaire.

Results
Dietary total omega-3 long-chain polyunsaturated fatty acid (LCPUFA) intake was inversely associated with neovascular (NV) AMD (39% decreased risk), as was docosahexaenoic acid, a retinal omega-3 LCPUFA (46% decreased risk), comparing highest vs lowest quintile of intake.

Higher fish consumption, both total and broiled/baked, was also inversely associated with NV AMD (39% and 35% decreased risk, respectively).

Dietary arachidonic acid was directly associated with NV AMD prevalence (54% increased risk).

Conclusion
Higher intake of omega-3 LCPUFAs and fish was associated with decreased likelihood of having NV AMD.

THESE AUTHORS ALSO NOTE:

“There is no known method to prevent the development of advanced age-related macular degeneration (AMD), the leading cause of irreversible vision loss in the United States among persons older than 65 years.”

“Nutrient-based preventive treatments for AMD development and progression were examined in a controlled randomized clinical trial in the Age-Related Eye Disease Study (AREDS). The use of high doses of a combination of antioxidants (vitamin C, vitamin E, and beta carotene) and zinc reduced the risk of development of advanced AMD by about 25% in participants who had at least a moderate risk of developing AMD.”
In the subjects of this study and in the controls, habitual dietary intake of DHA, EPA, total omega-3 LCPUFAs, arachidonic acid, monounsaturated fatty acids, saturated fatty acids, and cholesterol, in the year prior to enrollment are the primary independent variables in the analyses.

RESULTS

Increased DHA omega-3 reduced AMD by 40%.

Increased total omega-3 reduced AMD by 37%.

The highest intake saturated fatty acid group increased AMD by 56%.

The highest intake of cholesterol increased AMD by 34%.

“Odds of NV AMD were significantly increased among participants classified in the highest quintile of arachidonic acid intake [by 54%]”

Total fish intake of more than 2 medium servings per week was associated with lower risk of AMD by 39%.

Arachidonic acid is a major LCPUFA of the omega-6 family. Major sources of arachidonic acid in the diets of participants in this study were beef and pork (32%), turkey and chicken (25%), eggs (20%), and fish (11%).

There was a significant trend for increased risk of AMD with decreasing DHA.

Higher levels of total omega-3 LCPUFA and omega-3 LCPUFA–rich food intake were associated with a lower likelihood of NV AMD.

“Participants with reported omega-3 LCPUFA intake in the highest quintile were 40% less likely to be in the NV AMD group than participants with reported intake in the lowest quintile.”

“Participants with reported intake in the highest quintile for AA, an omega-6 LCPUFA, were 1.5 times more likely to be in the NV AMD group than participants with intake in the lowest quintile.”

“Docosahexaenoic acid and EPA may serve as protective agents in the retina because of their influence on gene expression, retinal cell differentiation, and survival.”

“Participants with a college education were almost twice as likely to be in a higher quintile of DHA intake than people with 12 or fewer years of education.”
CONCLUSIONS

“This AREDS report provides evidence that people reporting highest levels of omega-3 LCPUFA intake have a decreased likelihood of having NV AMD relative to people reporting lowest levels of intake.”

“Because increased intake of AA is also associated with an increased likelihood of having NV AMD, it is important to consider the balance and composition of dietary LCPUFAs from the omega-3 and omega-6 families.”

“These results and those from other observational analytic investigations suggest that modifying diet to include more foods rich in omega-3 LCPUFAs could result in a reduction in the risk of having NV AMD.”

KEY POINTS FROM DAN MURPHY

1) Advanced age-related macular degeneration (AMD) is the leading cause of irreversible vision loss in the United States among persons older than 65 years.

2) The use of high doses of a combination of antioxidants (vitamin C, vitamin E, and beta carotene) and zinc reduced the risk of development of advanced AMD by about 25%.

3) In this study, higher intake of omega-3 LCPUFAs and fish was associated with decreased likelihood of having NV AMD.

   - Increased DHA omega-3 reduced AMD by 40%.
   - Increased total omega-3 reduced AMD by 37%.

   - Total fish intake of more than 2 medium servings per week was associated with lower risk of AMD by 39%.

4) Those consuming the highest amounts of arachidonic acid (an omega-6 fatty acid) increased the risk of AMD by arachidonic acid intake 54%. The major sources of arachidonic acid in the diets of participants in this study were beef and pork, turkey and chicken, and eggs.

5) There was a significant trend for increased risk of AMD with decreasing DHA.

6) People with a college education are almost twice as likely to be high consumers of DHA omega-3 than people with 12 or fewer years of education.

7) “Because increased intake of AA is also associated with an increased likelihood of having AMD, it is important to consider the balance and composition of dietary LCPUFAs from the omega-3 and omega-6 families.”