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Fish consumption, long-chain omega-3 fatty acids and risk of cognitive decline or Alzheimer disease: a complex association

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Abstract

Long-chain omega-3 fatty acids could have neuroprotective properties against dementia, which is becoming a major global public health issue. We conducted a systematic review of the literature to establish the association between eating fish (a source of long-chain omega-3 fatty acids) or taking long-chain omega-3 fatty acid supplements and the risk of cognitive decline or Alzheimer disease (AD). We identified eleven observational studies and four clinical trials. All three observational studies that used cognitive decline as an outcome reported significant benefits, whereas only four of eight observational studies that used incidence of AD or

dementia as an outcome reported positive findings. None of four small clinical trials provided convincing evidence for the use of this approach in the prevention or treatment of any form of dementia. In summary, the existing data favor a role for long-chain omega-3 fatty acids in slowing cognitive decline in elderly individuals without dementia, but not for the prevention or treatment of dementia (including AD). This apparent dichotomy might reflect differences in study designs with regard to participants, dosages, the ratio of long-chain omega-3 to omega-6 fatty acids, or the choice of outcome measurements. Large clinical trials of extended duration should help to provide definitive answers.

Key Points

- Long-chain omega-3 fatty acids are essential for normal brain development
- Levels of omega-3 fatty acids are decreased in the brains of patients with Alzheimer disease (AD)
- Biological studies and animal models suggest that omega-3 fatty acids have a role in primary prevention of cognitive decline by improving blood flow, decreasing inflammation and/or reducing amyloid- β pathology
- Evidence from observational studies in humans favors consumption of long-chain omega-3 fatty acids to reduce cognitive decline with aging
- The clinical trials conducted to date have shown no benefits of omega-3 fatty acids for secondary prevention or treatment of AD

- Larger, ongoing, randomized trials should provide more-definitive answers regarding the use of long-chain omega-3 fatty acids for the prevention and/or treatment of AD

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Ethics declarations

Competing interests

The authors declare no competing financial interests.

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