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IN THE NEWS

Fish And N-3 Fatty Acids Reduce Risk Of Alzheimer's Disease

A new study, from the Rush-Presbyterian, St. Lukes Medical Center, in Chicago, shows that people who consumed at least one serving of fish a week dramatically reduced their risk of Alzheimer's disease, compared to those who rarely or never ate fish. Dietary intake of omega-3 fatty acids had a similar risk-lowering effect.¹

The prospective study involved 815 Chicago nursing home residents, aged 65 to 94, unaffected by Alzheimer's disease (AD). Participants completed a dietary frequency questionnaire that included 4 seafood items: Tuna fish sandwich, fish sticks/fish cakes/fish sandwich, fresh fish as a main dish, and shrimp/crab/lobster. Total omega-3 fatty acid (n-3) intake was calculated as the sum of alpha linolenic acid, eicosapentaenoic acid (EPA), and docosahexaenoic acid (DHA).²

After an average follow up of 3.9 years, 131 of the participants were diagnosed as having AD. The incidence of AD was inversely associated with fish consumption. Persons who ate fish once a week or more shaved a 60% lower risk of AD, compared to those who rarely or never ate fish (fresh fish as the main course was the type consumed most frequently). A similar inverse association was found with total n-3 fatty acid intake. Persons who consumed the highest amounts (median 1.75 g/day), had a 70% reduced likelihood of having AD, compared to those with the lowest intake (median 0.9 g/day).³



Of the marine fatty acids (EPA, DHA) only DHA was protective, reducing the risk of AD by 60%, in age-adjusted calculations. DHA is the most abundant fatty acid in brain phospholipids, present in high amounts in the cerebral cortex, mitochondria, and neural connections. EPA had little effect on AD risk, as intake was low, with 40% of participants consuming 0 g/day. (In a 24 hour dietary recall, more than 90% of 234 participants said they ate fish low in fat.) Dr. Martha Claire Morris, the lead investigator, conceded that one cannot rule out a protective effect of EPA, obtained by intake of fatty fish or fish oil supplements. Intake of linolenic acid (found mainly in vegetable oil-based salad dressing and nuts) was protective in persons carrying a gene that has been linked to risk of AD.

The study adds to previous findings on the relationship between fish consumption, n-3 fatty acids and brain health. A Canadian study showed that n-3 fatty acid levels in plasma phospholipids of patients with AD and other cognitive disorders were lower compared to levels in age-matched controls; a large study in France, of people aged 68 and older, showed that "elderly people who eat fish at least once a week are at a lower risk of developing dementia, including AD." The authors suggested that "in addition to providing vascular protection, the fatty acids contained in fish oils could reduce inflammation in the brain."

An accompanying editorial to the Chicago report, suggested that a healthy diet containing antioxidant-rich foods and fish is likely to lower the risk of AD and other ailments, and that fish oil supplements can be good sources of omega-3 fatty acids.

—Carmia Borek, Ph.D.

References

1. Morris MC, Evans DA, Bienias JL, et al. Consumption of fish and n-3 fatty acids and risk of incident Alzheimer disease. *Arch Neurol.* 2003 Jul;60(7):940-6.
2. Barberger-Gateau P, Letenneur L, Deschamps V, Peres K, Dartigues JF, Renauds. Fish, meat and risk of dementia: cohort study. *BMJ.* 2002 Oct 26;325(7370):932-3.
3. Conquer JA, et al. Fatty acid analysis of blood plasma of patients with Alzheimer's disease, other types of dementia, and cognitive impairment. *Lipids.* 2000 Dec;35(12):1305-12.

IN THE NEWS

IL-6 May be Stress-Health Link

You don't need research to tell you that stress can make you sick. However, a new study may have discovered the link between stress and health – interleukin-6 (IL-6).¹

IL-6 is a proinflammatory cytokine (small protein released by cells) that directly affects the behavior of other cells in the body. It is associated with many diseases, including arthritis, cancer, diabetes, osteoporosis, Alzheimer's dementia, periodontal disease and cardiovascular disease. IL-6 has also been linked to frailty and functional decline in old age.

Perhaps one of the most important concerns about IL-6 is that it is directly linked to cardiovascular disease. This is due, at least in part, to the fact that it plays a central role in promoting the production of C-reactive protein (CRP), a marker of inflammation that, when elevated, is a significant risk factor for heart attack and other cardiovascular diseases.²

Both IL-6 and CRP are also involved in the pathogenesis of diabetes. In one study, women with elevated levels of these proteins were much more likely to develop type 2 diabetes during a four-year study period than women with low levels of IL-6 and CRP.³

Other studies have shown that negative emotions such as depression and stressful experiences can promote the production of IL-6 and other proinflammatory cytokines. Furthermore, negative emotions can lead to greater risk of infection, prolonged infection, and slowed wound healing. All of these processes, in turn, can promote sustained release of proinflammatory cytokines, such as IL-6.

In an effort to elicit the connection between stress and poor health, researchers at Ohio State University measured IL-6 levels of 119 people caring for spouses with dementia and compared their findings to IL-6 levels in 106 healthy control participants who were not caring for a sick relative. The average caregiver spent more than nine hours each day in caregiving-related activities over an average of nearly five years. The average age of the participants was just over 70. Prior to starting the study, 28 of the caregivers' spouses had already died and an additional 50 died during the study period.

For their research, the investigators drew blood levels of IL-6 and gave the participants surveys at least once a year for six years. The surveys included questions on perceived stress, depression, loneliness, general health, alcohol intake, smoking habits, sleep, and exercise. They compared the survey results to the IL-6 levels and published their findings in the July 22, 2003 issue of the *Proceedings of the National Academy of Sciences of the United States of America*.

The researchers found that during the six-year study period, caregivers reported significantly more stress and loneliness than the control subjects. During that same time frame, blood levels of IL-6 increased an average of four times faster among the caregivers than the control participants.

Even after a spouse died, the caregivers continued to exhibit an increase in IL-6 levels. The investigators hypothesize that this may be due to a combination of biological and psychological mechanisms, as previous research has already shown that stress and depression can permanently alter the immune system.

In a previous study, caregivers who described themselves as "strained" were 63% more likely to die during the study period than non-caregiving control subjects.⁴ The authors of the current study suggest that their "IL-6 findings provide one viable mechanism that could explain caregivers' substantial differences in mortality across a range of illnesses."

The researchers concluded the study article by stating: "The finding that caregivers' average rate of increase in IL-6 was about four times as large as that of non-caregivers suggests that a chronic stressor is capable of substantially augmenting normal age-related increases, effectively prematurely aging the immune response. These data provide important evidence of a key mechanism through which chronic stressors may have potent health consequences for older adults, accelerating risk of a host of age-related diseases."

It is important to note that previous research has shown that poor health habits can also raise levels of IL-6. This includes smoking, lack of exercise, poor sleep habits, and being overweight. These findings suggest that although reducing stress is important in our pursuit for better health, maintaining a healthy lifestyle is imperative as well.

"The bad news is that if you are experiencing chronic stress, such as caregiving or another difficult situation, you need to be aware that the stress can significantly impact your health," study author Dr. Ronald Glaser, Director of the Institute for Behavioral Medicine Research at the Ohio State University College of Medicine, told Life Extension magazine.

“The good news is you can minimize the impact stress has on your health by exercising, stopping smoking, getting good sleep, and social networking with friends and family to help cope with your stressors,” said Glaser. “All of these can lower IL-6 levels. They are not easy to do, but well worth it.”

—Marc Ellman, M.D.

Editor’s note: Supplements that have been shown to lower elevated IL-6 are DHEA and the DHA fraction of fish oil. If IL-6 levels remain persistently high even when taking these supplements, consider asking your doctor to prescribe a bisphosphonate drug (such as Zometa®) that protects against bone destruction that releases excess IL-6 into the body. The Life Extension Foundation may soon have an IL-6-lowering herbal extract available.

References

1. Kiecolt-Glaser JK, Kiecolt-Glaser JK, Preacher KJ, MacCallum RC, Atkinson C, Malarkey WB, Glaser R. Chronic stress and age-related increases in the proinflammatory cytokine IL-6. *Proc Natl Acad Sci U S A* 2003 Jul 22;100(15):9090-9095. Epub 2003 Jul 02.
2. Pradhan AD, Manson JE, Rifai N, Buring JE, Ridker PM. C-reactive protein, interleukin 6 and risk of developing type 2 diabetes mellitus. *JAMA* 2001 Jul 18;286(3):327-34.
3. Ridker PM, Cushman M, Stampfer MJ, Tracy RP, Hennekens CH. Inflammation, aspirin, and the risk of cardiovascular disease in apparently healthy men. *N Engl J Med* 1997 Apr 3;336(14):973-9.
4. Schulz R, Beach SR. Caregiving as a risk factor for mortality: the Caregiver Health Effects Study. *JAMA* 1999 Dec 15;282(23):2215-9.

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