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Studies champion omega-3s for slowing mental decline

By Stephen Daniells

11/04/2007- **Increased bloods levels of the omega-3 fatty acids EPA and DHA could "postpone" age-related cognitive decline that may precede dementia and Alzheimer's disease, suggest two new studies.**

An increasing number of studies are reporting potential benefits for regular fish consumption and omega-3 fatty acids with respect to Alzheimer's, but only a limited number of studies have looked at the decline in cognitive function that precedes these diseases.

Currently, about 12 million people in the US plus the EU suffer from Alzheimer's, with some estimates predicting this figure will have tripled by 2050. The direct and indirect cost of Alzheimer care is over $100 bn (€ 81 bn) in the US alone. The direct cost of Alzheimer care in the UK was estimated at £15 bn (€ 22 bn).

Two new studies published in the current issue of the *American Journal of Clinical Nutrition* report that regular consumption of omega-3-rich food could prevent age-related cognitive decline.

The first study, led by Boukje Maria van Gelder from the Dutch National Institute for Public Health and the Environment, used a longitudinal assessment of 210 men without Alzheimer disease enrolled in the Zutphen Elderly Study. Dietary assessment was collected via cross-check dietary histories in 1990, when the subjects were 70-89 years of age. Cognitive function was assessed using the Mini-Mental State Examination (MMSE).

The authors conclude that, over a period of five years, consumption of approximately 400 mg omega-3 fatty acids eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) per day had less cognitive decline than those who consumed only about 20 mg per day of the fatty acids.

"To prevent cardiovascular disease mortality, the American Heart Association recommends the consumption of fish (preferably fatty fish) at least twice a week," wrote the authors. *"That recommendation is compatible with the results of the current study."*

A second study, led by May Beydoun from the University of North Carolina, used a prospective design to investigate the potential benefits of omega-3 levels in the blood with cognitive decline in 2251 white adults (average age 57 at baseline).

Blood fatty acid concentrations were measured in all subjects at the start of the study and correlated with cognitive function assessed three and nine years later. The tests assessed the subjects' verbal learning, recent memory, psychomotor performance, linguistic impairment, and global cognition.

After adjustment for potential confounding factors, the researchers report that global cognitive decline was not associated with omega-3 blood levels at baseline, but a subgroup analysis examining specific types of cognitive decline found that greater blood omega-3 fatty acid levels may prevent a decline in verbal fluency.

"On the basis of our findings, reason exists to believe that subjects who are under increased oxidative stress, particularly hypertensive and dyslipidemic [disordered lipoprotein metabolism] subjects, may benefit from enriching their diet with omega-3 highly unsaturated fatty acids, which are mostly found in cold-water fish and other foods of marine origin," wrote the researchers.

In an accompanying editorial by Willam and Sonya Connor from the Oregon Health and Science Univserity, the importance of DHA in the development and maintenance of the cerebral cortex was emphasised.

"The brains of Alzheimer disease patients have a lower content of DHA in the grey matter of the frontal lobe and hippocampus than do the brains of persons without Alzheimer's disease," they said.

"The entrance of DHA into the brain could correct DHA deficiency in membrane phospholipids in the cerebral cortex in patients with Alzheimer disease, and EPA would counter the proinflammatory action of arachidonic acid, which is a precursor of cytokine and proinflammatory eicosanoids that may be associated with greater cognitive decline."

Connor and Conner called for clinical trials of dietary fish, fish oil, or both in elderly individuals at risk of cognitive decline and Alzheimer disease.

The risk of pollutants from oily fish, such a methyl mercury, dioxins, and polychlorinated biphenols (PCBs) have led to some claims to reduce fresh fish intake, especially for pregnant women who may damage the development of their babies.

Such concerns have seen the number of omega-3 enriched or fortified products on the market increase. Most extracted fish oil are molecularly distilled and steam deodorised to remove contaminants.

According to Frost and Sullivan, the European omega-3 market was worth around €160m (£108m) in 2004, and is expected to grow at rates of 8 per cent on average to 2010.

Source: *American Journal of Clinical Nutrition*
Volume 85, Pages 1142-1147
"Fish consumption, n-3 fatty acids, and subsequent 5-y cognitive decline in elderly men: the Zutphen Elderly Study"
Authors: BM van Gelder, M. Tijhuis, S. Kalmijn, D. Kromhout

Volume 85, Pages 1103-1111
"Plasma n-3 fatty acids and the risk of cognitive decline in older adults: the Atherosclerosis Risk in Communities Study"
Authors: M.A. Beydoun, J.S. Kaufman, J.A. Satia, W. Rosamond, A.R. Folsom

Editorial: Volume 85, Pages 929-930
"The importance of fish and docosahexaenoic acid in Alzheimer disease"
Authors: W.E. Connor, S.L. Connor

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