

Higher levels of mercury in brain not linked with increased risk of Alzheimer's disease

February 2 2016

In a study of deceased individuals, moderate seafood consumption was correlated with lesser Alzheimer disease neuropathology, and although seafood consumption was associated with higher brain levels of mercury, the higher mercury levels were not correlated with more Alzheimer disease neuropathology, according to a study in the February 2 issue of *JAMA*.

Numerous studies have found protective associations between seafood consumption and dementia. Little is known about the relationship between seafood consumption and brain neuropathology. Seafood is a source of mercury, a neurotoxin that impairs neurocognitive development. Mercury toxicity is reduced by selenium, an essential nutrient present in seafood.

Martha Clare Morris, Sc.D., of Rush University Medical Center, Chicago, and colleagues examined whether seafood consumption is correlated with increased brain mercury levels and also whether seafood consumption or brain mercury levels are correlated with brain neuropathologies. The study included analyses of deceased participants in the Memory and Aging Project clinical neuropathological cohort study, 2004-2013. The average age at death was 90 years and 67 percent were women. Seafood intake was first measured by a food frequency questionnaire at an average of 4.5 years before death.

Among the 286 autopsied brains of 544 participants, brain mercury levels were positively correlated with the number of seafood meals

consumed per week. In models adjusted for age, sex, education, and total energy intake, seafood consumption (one or more meal[s]/week) was significantly correlated with less Alzheimer disease pathology, including lower density of neuritic plaques, less severe and widespread neurofibrillary tangles and lower neuropathologically defined Alzheimer disease, but only among apolipoprotein E (APOE ϵ 4) carriers, a gene variant associated with an increased risk of developing Alzheimer disease.

Fish oil supplementation had no statistically significant correlation with any neuropathologic marker. Although seafood consumption was correlated with higher brain levels of mercury, the higher mercury levels were not significantly correlated with increased levels of brain neuropathology.

The authors note that the findings were from a very old, largely non-Hispanic white cohort and may not be generalizable to younger adults or other racial or ethnic groups.

"To our knowledge, this is the first study to report on the relationship between brain concentrations of mercury and brain neuropathology or diet. The finding of no deleterious correlations of mercury on the brain is supported by a number of case-control studies that found no difference between Alzheimer disease patients and controls in mercury concentrations in the brain, serum, or whole blood."

Editor's Note: This study was supported by National Institutes of Health grants. Please see the article for additional information, including other authors, author contributions and affiliations, financial disclosures, etc.

Editorial: Fish Consumption, Brain Mercury, and Neuropathology in Patients With Alzheimer Disease and Dementia

"Patients and their families may be hopeful that interventions such as seafood consumption may help reduce clinical manifestations of Alzheimer disease or dementia, and the report by Morris et al provides reassurance that seafood contamination with mercury is not related to increased brain pathology," write Edeltraut Kroger, Ph.D., and Robert Laforce Jr., M.D., Ph.D., of Universite Laval, Quebec City, Quebec, Canada, in an accompanying editorial.

"Eating fatty fish may continue to be considered potentially beneficial against cognitive decline in at least a proportion of older adults, a strategy that now generally should not be affected by concerns about mercury contamination in fish. Such a simple strategy is encouraging in the light of the lack of evidence on protection against many neurodegenerative diseases such as Alzheimer disease and Parkinson disease, another cause of dementia."

More information: *JAMA*, doi:10.1001/jama.2015.19451
JAMA, doi:10.1001/jama.2016.0005

Provided by The JAMA Network Journals

Citation: Higher levels of mercury in brain not linked with increased risk of Alzheimer's disease (2016, February 2) retrieved 23 April 2024 from <https://medicalxpress.com/news/2016-02-seafood-consumption-role-alzheimer.html>

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