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Circulating Omega-3 Polyunsaturated Fatty Acids and Subclinical Brain Abnormalities on MRI in Older Adults: The Cardiovascular Health Study.

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Abstract

BACKGROUND:

Consumption of tuna or other broiled or baked fish, but not fried fish, is associated with fewer subclinical brain abnormalities on magnetic resonance imaging (MRI). We investigated the association between plasma phospholipid omega-3 polyunsaturated fatty acids (PUFAs), objective biomarkers of exposure, and subclinical brain abnormalities on MRI.

METHODS AND RESULTS:

In the community-based Cardiovascular Health Study, 3660 participants aged ≥ 65 underwent brain MRI in 1992-1994, and 2313 were rescanned 5 years later. MRIs were centrally read by neuroradiologists in a standardized, blinded manner. Participants with recognized transient ischemic attacks or stroke were excluded. Phospholipid PUFAs were measured in stored plasma collected in 1992-1993 and related to cross-sectional and longitudinal MRI findings. After multivariable adjustment, the odds ratio for having a prevalent subclinical infarct was 0.60 (95% CI, 0.44 to 0.82; P for trend=0.001) in the highest versus lowest long-chain omega-3 PUFA quartile. **Higher long-chain omega-3 PUFA content was also associated with better white matter grade**, but not with sulcal or ventricular grades, markers of brain atrophy, or with incident subclinical infarcts. The phospholipid intermediate-chain omega-3 PUFA alpha-linolenic acid was associated only with modestly better sulcal and ventricular grades. However, this finding was not supported in the analyses with alpha-linolenic acid intake.

CONCLUSIONS:

Among older adults, higher phospholipid long-chain omega-3 PUFA content was associated with lower prevalence of subclinical infarcts and better white matter grade on MRI. Our results support the beneficial effects of fish consumption, the major source of long-chain omega-3 PUFAs on brain health in later life. The role of plant-derived alpha-linolenic acid in brain health requires further investigation.