**Alzheimer's, All-Cause Dementia Linked to Trans Fats**

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Higher serum levels of trans fatty acids were associated with a greater risk of developing all-cause dementia and Alzheimer's disease in old age. Cognitively normal adults with higher levels of serum elaidic acid -- an isomer of oleic acid formed by partial hydrogenation of vegetable oils -- in their blood were 50% to 75% more likely to develop Alzheimer's or dementia years later compared with people with lower levels.

Researchers drew their conclusions from an analysis of an ongoing population-based prospective cohort study that has been conducted in the town of Hisayama, Japan since 1961 (the Hisayama [Study](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6192972/)). A total of 1,628 Japanese community residents ages 60 and older without dementia at baseline were observed from 2002 to 2012 (median 10.3 years, interquartile range [IQR] 7.2-10.4 years, follow-up rate 99.8%). Researchers used [DSM-III-R](https://n.neurology.org/content/neurology/56/9/1143.full.pdf) guidelines to define participants with dementia, [NINCDS‐ADRDA](https://n.neurology.org/content/34/7/939) criteria to identify Alzheimer's disease, and [NINDS-AIREN](https://n.neurology.org/content/43/2/250) criteria to diagnose vascular dementia.

During the follow-up period, 377 participants developed all-cause dementia, 247 developed Alzheimer's disease, and 102 developed vascular dementia. Serum elaidic acid concentrations, as measured by gas chromatography/mass spectrometry (10 μmol/L of elaidic acid standard), were categorized into quartiles.

Overall, the median serum elaidic acid level was 9.40 μmol/L (IQR 6.97-13.71 μmol/L) for men and 10.90 μmol/L (IQR 8.23-15.14 μmol/L) for women. Median values (ranges) for the highest quartile, Q4, and lowest quartile, Q1, were 18.83 (14.51-64.37) μmol/L and 6.24 (2.64-7.69) μmol/L, respectively.

Participants with higher serum elaidic acid levels were on average younger and less likely to be men, current drinkers, or physically active, according to the researchers. While total energy intake decreased with higher quartiles of serum elaidic acid, systolic and diastolic blood pressure, serum total cholesterol, serum triglycerides, body mass index, and dietary intake of saturated fat increased with higher levels of this trans fatty acid.

Researchers performed brain autopsies on 237 of the 369 people who died during the follow-up period (101, 81, 76, and 111 in Q1, Q2, Q3, and Q4, respectively); in these cases, the researchers used both clinical and neuropathologic information to make a definitive diagnosis.

Using a similar mathematical approach, researchers calculated Alzheimer's disease incidence rates per 1,000 person-years for the highest (Q4) and lowest (Q1) serum elaidic acid levels of 18.2 and 13.1, respectively.

Following multivariable adjustments, the highest elaidic acid group had an incident dementia HR of 1.52 (95% CI 1.10-2.12, *P*=0.01) and the second-highest group had an HR of 1.74 (95% CI 1.28-2.37, *P*<0.001).

Taken together, the results showed that higher serum elaidic acid levels were significantly associated with greater risk of developing all-cause dementia (*P* for trend 0.003) and Alzheimer's disease (*P* for trend 0.02) after adjustment for traditional risk factors. No significant associations were found between serum elaidic acid levels and vascular dementia.

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