Aluminum forms in drinking water and risk of Alzheimer's disease.

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Abstract
The objective of this study was to assess the relation between long-term exposure to different aluminum (Al) forms in drinking water and Alzheimer's disease (AD). The study participants were selected from a random sample of the elderly population (> or = 70 years of age) of the Saguenay-Lac-Saint-Jean region (Quebec). Sixty-eight cases of Alzheimer's disease diagnosed according to recognized criteria were paired for age (+/-2 years) and sex with nondemented controls. Aluminum speciation was assessed using established standard analytical protocols along with quality control procedures. Exposure to Al forms (total Al, total dissolved Al, monomeric organic Al, monomeric inorganic Al, polymeric Al, Al(3+), AlOH, AlF, AlH(3)SiO(2+)(4), AlSO(4)) in drinking water was estimated by juxtaposing the subject's residential history with the physicochemical data of the municipalities. The markers of long-term exposures (1945 to onset) to Al forms in drinking water were not significantly associated with AD. On the other hand, after adjustment for education level, presence of family cases, and ApoE varepsilon4 allele, exposure to organic monomeric aluminum estimated at the onset of the disease was associated with AD (odds ratio 2.67; 95% CI 1.04-6.90). On average, the exposure estimated at the onset had been stable for 44 years. Our results confirm prime the importance of estimation of Al speciation and consideration of genetic characteristics in the assessment of the association between aluminum exposure and Alzheimer's disease.

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