Association of air pollution with cognitive functions and its modification by APOE gene variants in elderly women

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Epidemiological studies have shown effects of long-term exposure to air pollution on cardiovascular and respiratory health. However, studies investigating the effects of air pollution on cognition and brain function are limited. We investigated if neurocognitive functions are associated with air pollution exposure and whether apolipoprotein E (ApoE) alleles modify the association of air pollution exposure with cognition.; We investigated 789 women from the SALIA cohort during the 22-year follow-up examination (2008-2009). Exposure to particulate matter (PM) size fractions and nitrogen oxides (NOx) were assigned to home addresses. Traffic indicators were used to assess residential proximity to high traffic load. Level of cognitive performance was assessed using the CERAD-Plus test. Air pollution effects on cognitive functioning were estimated cross-sectionally using adjusted linear regression models.; Air pollution was negatively associated with cognitive function and cognitive performance in the subtests for semantic memory and visuo-construction. Significant associations could be observed for figure copying with an interquartile range increase of NO2 (β=-0.28 (95%CI:-0.44;-0.12)), NOx (β=-0.25 (95%CI:-0.40;-0.09)), PM10 (β=-0.14 (95%CI:-0.26;-0.02)) and PM2.5 (β=-0.19 (95%CI:-0.36;-0.02)). The association with traffic load was significant in carriers of one or two ApoE <3;4 risk alleles.; In this study of elderly women, markers of air pollution were associated with cognitive impairment in the visuospatial domain. The association of traffic exposure is significant in participants carrying the ApoE ε4 risk allele.

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