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ABSTRACT E-BOOK

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Exposure to particulate matter and risk of conversion from mild cognitive impairment to dementia: a cohort study in a Northern Italy population

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Background/Aim Exposure to air pollutants such as inhalable particulate matter has been linked to increased risk of chronic disease including neurodegenerative diseases, such as Alzheimer's dementia. In this study, we aimed to evaluate the effect of long-term exposure to outdoor air pollution, and specifically to particulate matter $\leq 10 \mu\text{m}$ (PM10), on the risk of dementia in a cohort of subjects with mild cognitive impairment. **Methods** We recruited 53 subjects newly-diagnosed with mild cognitive impairment of non-vascular origin and residing in the Modena and Reggio Emilia provinces of Northern Italy. Using a Geographical Information System and a validated air pollution dispersion model, we assessed exposure to outdoor PM10 from motorized traffic at subjects' residence. We investigated the relation of these concentrations to subsequent onset of dementia, using a Cox proportional hazards model. We computed hazard ratio (HR) and 95% confidence interval (CI) according to fixed categories of PM10 exposure, adjusting for sex, age, and educational attainment level. **Results** During a median follow-up of 42 months, 19 participants developed Alzheimer's dementia, 3 frontotemporal dementia and 2 Lewy body dementia. Baseline PM10 exposure levels were $9.6 \mu\text{g}/\text{m}^3$ on average. Using PM10 levels below $5 \mu\text{g}/\text{m}^3$ as reference, we found a dose-response increase in any dementia risk with HR of 1.04 (95% CI 0.41-2.66) at $5\text{-}10 \mu\text{g}/\text{m}^3$, 1.32 (95% CI 0.36-4.92) at $10\text{-}20 \mu\text{g}/\text{m}^3$, and 1.38 (95% CI 0.14-13.13) above $20 \mu\text{g}/\text{m}^3$, respectively. **Conclusions** Our results suggest that exposure to particulate matter emitted by motorized vehicles increases the risk of conversion from mild cognitive impairment to dementia, though the low number of study participants suggests caution in the interpretation of these findings.
