

Psychosocially hazardous neighborhoods associated with worse cognitive function in some older adults

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Residing in a psychosocially hazardous neighborhood is associated with worse cognitive function in older age for persons with the apolipoprotein E ϵ 4 allele (an alternative form of the gene), according to a report in the March issue of *Archives of General Psychiatry*.

"A prominent genetic factor of relevance to cognitive decline is the ϵ 4 variant of the apolipoprotein E (APOE) gene, a strong predictor of increased risk and earlier onset of Alzheimer disease," the authors write as background information in the article. Apolipoprotein E is critical for basic neurological processes relevant to non-demented neurological health. "In the present article, we tested the hypothesis that living in psychosocially hazardous neighborhood environments may interact with APOE genotype to influence cognitive function."

Brian K. Lee, Ph.D., of Drexel University School of Public Health, Philadelphia, and colleagues analyzed data from the Baltimore Memory Study on 1,124 urban residents between 50 and 70 years of age to assess the association between living in a psychosocially hazardous neighborhood and cognitive function in aging. Patients were mostly white (53.8 percent) or African American (41.5 percent), and resided in any of the 63 Baltimore neighborhoods included in the study. Psychosocially hazardous neighborhoods are defined as areas that "give rise to a heightened state of vigilance, alarm, or fear in residents that may lead to a biological stress response."

Overall, 30.4 percent of participants possessed at least one $\epsilon 4$ allele, however the presence of the APOE $\epsilon 4$ differed by race/ethnicity, with 37.3 percent of African Americans $\epsilon 4$ positive compared with 24.7 percent of non-African Americans.

Before adjustment for outside factors (such as race, sex, wealth, etc.), participants living in the most psychosocially hazardous neighborhoods performed substantially worse in all seven cognitive domains tested (language, processing speed, eye-hand coordination, executive functioning, verbal memory and learning, visual memory, and visuoconstruction). In adjusted analysis with both neighborhood and APOE terms, persons living in the most psychosocially hazardous neighborhoods scored lower only on eye-hand coordination than other participants. APOE $\epsilon 4$ was associated with worse performance in executive function and visuoconstruction (ability to organize and manually manipulate spatial information, usually in the reproduction of geometric figures).

Compared with persons negative for APOE $\epsilon 4$ allele in less psychosocially hazardous neighborhoods, those who are negative for the allele and were living in the most psychosocially hazardous neighborhoods did not perform worse in any of the tested domains, nor did persons positive for APOE $\epsilon 4$ who were living in less psychosocially hazardous neighborhoods. However, persons positive for APOE $\epsilon 4$ living in the most psychosocially hazardous neighborhoods performed significantly worse than all three groups in processing speed, eye-hand coordination, executive functioning and visuoconstruction.

"Our findings provide evidence that among persons with the APOE $\epsilon 4$ allele, cognitive performance in processing speed and executive function was significantly worse for persons residing in neighborhoods with higher levels of psychosocial hazards, with additional suggestive evidence for eye-hand coordination," the authors conclude. Additionally,

"for genetically vulnerable persons, a psychosocially hazardous neighborhood environment may be detrimental for cognitive function in aging."

More information: *Arch Gen Psychiatry*. 2011;68[3]:314-321.

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