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Lower Cognitive Performance With Secondary Smoke Exposure

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[Authors and Disclosures](#)

November 17, 2011 (Washington, DC) — Older people who are exposed to second-hand smoke have significantly lower scores on cognitive performance tests than those who are not exposed, according to research presented here at the American Public Health Association 139th Annual Meeting.

Previous studies have suggested that active smoking affects cognitive performance, but research on the cognitive effects of secondary smoke exposure is lacking.

"Our group was interested in examining the association between environmental tobacco smoke and cognitive performance and gait speed using a population-based sample, and whether cardiovascular disease modifies the effect of environmental tobacco smoke on cognitive performance," said lead author Wajiha Akhtar, MPH, from the Department of Epidemiology, University of Florida, in Gainesville.

Ms. Akhtar and her colleagues analyzed data on 2957 patients enrolled in the 1999–2002 National Health and Nutrition Examination Survey (NHANES) who were 60 years or older.

Exposure to environmental tobacco smoke was assessed using levels of blood cotinine, divided into tertiles.

Cotinine is an alkaloid found in tobacco that is commonly used as a biomarker for exposure to tobacco smoke.

Former and never smokers in the higher cotinine tertiles had decreased cognitive performance on the Digit Symbol Substitution Test ($P = .001$ and $P = .006$, respectively). This trend remained after adjustment for potential confounders, including diabetes, hypertension, body mass index, and blood lead levels ($P = .0048$ and $P = .006$, respectively).

Although the mechanisms underlying the association between secondary smoke exposure and cognitive decline are not clear, a vascular mechanism appears likely, Ms. Akhtar noted.

"Environmental tobacco smoke activates mediators, such as fibrinogen and thromboxane, which are responsible for platelet activation and increase the risk of thrombus formation. Platelets activated by environmental tobacco smoke have also been seen to damage the endothelium layer of the arterial wall," she explained.

"This, in effect, contributes to atherosclerotic plaque formation and progression, plaque rupture, and decreased blood flow because of thrombosis, which will inevitably lead to cardiovascular disease," Ms. Akhtar explained.

"In our study, we observed no change in cognitive decline in those who reported no heart attack, but a 3-fold increase in cognitive decline in those in the highest tertile group with a reported heart attack," Ms. Akhtar said. Studies have shown that an increased risk for cardiovascular disease is associated with an increased risk for cognitive decline.

She added that one reason cognitive performance was a focus of the study is that Alzheimer's disease is one of the top 10 leading causes of death that does not yet have a cure.

"For this reason, we need to understand the underlying mechanism of cognitive decline," she said.

"Poor physical performance has been associated with disability, hospitalization, and mortality. We can use an objective measure such as gait speed to characterize the relationship between environmental tobacco smoke and physical function."

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