Study finds association between air pollution and cognitive decline in women

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A large, prospective study led by a researcher at Rush University Medical Center indicates that chronic exposure to particulate air pollution may accelerate cognitive decline in older adults. The results of the study will be published in the Feb. 13 issue of *Archives of Internal Medicine*.

In the study, women who were exposed to higher levels of ambient particulate matter (PM) over the long term experienced more decline in their cognitive functioning over a four-year period. Higher levels of long-term exposure to both coarse PM (PM2.5-10) and fine PM (PM2.5) were associated with significantly faster cognitive decline.

PM air pollution consists of small particles suspended in the air. Particles that are less than 2.5 microns in diameter, which is 1/30th the width of human hair, are called fine PM and particles larger than 2.5-10 microns is called coarse PM.

These associations were present at levels of PM exposure typical in many areas of the United States.

There are few recent studies that analyze air pollution and cognitive function in older adults, but this is the first study to examine change in cognitive function over a period of time and whether exposure to the size of particulate matter is important.

Jennifer Weuve, MPH., ScD, assistant professor of the Rush Institute of Healthy Aging and the principal investigator of the study, along with her colleagues, evaluated air pollution, both coarse and fine, in relation to cognitive decline in older women using a study population from the Nurses' Health Study Cognitive Cohort, which included 19,409 U.S. women ages 70 to 81 for a 14-year period going back as far as 1988.

"Our study explored chronic exposure to particulate air pollution in relation to decline in cognitive functioning among older women," said Weuve. "Very is little known about the role of particulate matter exposure and its association with cognitive decline."

Exposure to particulate air pollution is associated with cardiovascular risk, which itself may play a role in causing or accelerating cognitive decline.

"Unlike other factors that may be involved in dementia such as diet and physical activity, air pollution is something we can intervene on as a society at large through policy, regulation and technology," said Weuve.

"Therefore, if our findings are confirmed in other research, air pollution reduction is a potential means for reducing the future population burden of age-related cognitive decline, and eventually, dementia," said Weuve.

Provided by Rush University Medical Center