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Does smoking increase your risk for dementia and cognitive decline?

Bethesda, Md. – Scientists from the Uniformed Services University (USU), Emory University and the University of Vermont have found that cigarette smoking is linked to increased lesions in the brain's white matter, called white matter hyperintensities. White matter hyperintensities, detected by MRI scan, are associated with cognitive decline and Alzheimer's disease. These findings may help explain the link between smoking and increased rates of dementia and other forms of cognitive decline.

The study, "Associations of cigarette smoking with gray and white matter in the UK Biobank" was published online in the journal, *Neuropsychopharmacology*, <https://rdcu.be/b1jPS>.

In June 2019, the Surgeons General of the Army, Navy, Air Force, and United States, released an open letter stating that tobacco use is a threat to the health and fitness of U.S. military forces and compromises readiness. This burden also extends to care provided by the Veterans Health Administration, which spends more than \$2.5 billion annually on smoking-related care. In response, Dr. Joshua Gray, assistant professor of Medical and Clinical Psychology and Neuroscience at USU, and colleagues, examined the association between cigarette smoking and brain structure. Cigarette smoking is associated with increased risk for myriad health consequences including increased risk for neuropsychiatric conditions, but research on the link between smoking and brain structure is limited.

Their study was the largest of its kind, including MRI brain scans from more than 17,000 individuals from the UK Biobank, a large cohort of volunteers from across the United Kingdom. They found that smoking was associated with smaller total gray and white matter volume, increased white matter lesions, and variation in specific gray matter regions and white matter tracts. By controlling for important variables that often co-occur with smoking, such as alcohol use, this study identified distinct associations between smoking and brain structure, highlighting potential mechanisms of risk for common neuropsychiatric consequences of smoking such as depression and dementia.

"Cigarette smoking is known to elevate risk for neuropsychiatric conditions such as depression and dementia. We found that smoking is associated with multiple aspects of brain structure, in particular with increased white matter lesions. White matter lesions are linked to many of the same neuropsychiatric diseases as smoking," said Gray. "Although further research is needed to understand to what extent smoking is a cause or consequence of these aspects of brain structure, our findings suggest a mechanism that links smoking to increased risk for dementia, depression, and other brain diseases."

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