

'Pothead' stereotype might be real, study suggests

By Dennis Thompson | HealthDay | AZCentral.com
December 17, 2013

Shrunken structures inside the brains of heavy marijuana users might explain the stereotype of the "pothead," brain researchers report.

Northwestern University scientists studying teens who were marijuana smokers or former smokers found that parts of the brain related to working memory appeared diminished in size -- changes that coincided with the teens' poor performance on memory tasks.

"We observed that the shapes of brain structures related to short-term memory seemed to collapse inward or shrink in people who had a history of daily marijuana use when compared to healthy participants," said study author Matthew Smith. He is an assistant research professor in psychiatry and behavioral sciences at the Northwestern University Feinberg School of Medicine, in Chicago.

The shrinking of these structures appeared to be more advanced in people who had started using marijuana at a younger age. This suggests that youngsters might be more susceptible to drug-related memory loss, according to the study, which was published in the Dec. 16 issue of the journal *Schizophrenia Bulletin*.

"The brain abnormalities we're observing are directly related to poor short-term memory performance," Smith said. "The more that brain looks abnormal, the poorer they're doing on memory tests."

The paper is provocative because the participants had not been using marijuana for a couple years, indicating that memory problems might persist even if the person quits smoking the drug, said Dr. Frances Levin, chairman of the American Psychiatric Association's Council on Addiction Psychiatry.

At the same time, Levin cautioned that the paper presents a chicken-or-egg problem. It's not clear whether marijuana use caused the memory problems or people with memory problems tended to use marijuana.

"The big \$64,000 question is (whether) these memory problems predate the marijuana use," Levin said.

The study focused on nearly 100 participants sorted into four groups: healthy people who never used pot, healthy people who were former heavy pot smokers, people with schizophrenia who never used pot and schizophrenics who were former heavy pot users.

Researchers used MRI scans to study the structure of participants' brains. Both healthy and schizophrenic marijuana users showed shrinkage of regions deep in the brain that are associated with memory.

"We found both of the marijuana-use groups had these parallel brain abnormalities," Smith said.

Tests of working memory further found that marijuana users scored lower compared with non-users.

Working memory is the ability to remember and process information in the moment and, if needed, transfer it to long-term memory. Poor working memory can lead to poor academic performance and problems with everyday life.

Healthy people who never used marijuana scored 37 times better, on average, than healthy users who had smoked in the past on memory tests, while "clean" schizophrenics scored nearly four times better than schizophrenic marijuana users.

The study confirms earlier findings that showed memory loss in young marijuana users, said Dr. Scott Krakower, assistant unit chief of psychiatry at Zucker Hillside Hospital in Glen Oaks, N.Y.

But Krakower said more work needs to be done before it's proven that marijuana actually causes changes in the brain. "Future research needs to be done to verify the implications of marijuana use on the ... structure of the brain," he said. "It needs to be studied in a group of people over a period of time."

Dr. Mitch Earleywine, a professor of psychology and director of clinical training at the State University of New York at Albany, agreed that the results need to be replicated.

"Brain structural studies often look at every single spot and then capitalize on the ones that are significant by chance," said Earleywine, author of the book *Understanding Marijuana*. "We've had no structural deficits in folks who started using as adults, so researchers went to adolescents."

Earleywine said marijuana users have been shown to perform more poorly on memory tests due to the stress they endure taking such tests.

"If you can imagine going into a lab to take a memory test because you've been selected for your cannabis use, then a bevy of white-coated folks who might think that cannabis use impairs memory start giving you memory tests, you might not do so well," he said. "We've found this for males in my lab."

The Northwestern study also noted that these changes in brain structure are similar to those associated with having schizophrenia.

“If someone has a family history of schizophrenia, they are increasing their risk of developing schizophrenia if they abuse marijuana,” Smith said.

But Krakower said that assertion might be a stretch.

“I thought that was a little bit of a jump,” he said. “We know people with schizophrenia use marijuana. It’s going to be very hard to say that someone has schizophrenia because they used marijuana. That’s going to be hard to prove.”

The Northwestern research is supported by grants from the U.S. National Institutes of Health.