

Study: Adolescent marijuana use leaves lasting mental deficits

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The persistent, dependent use of marijuana before age 18 has been shown to cause lasting harm to a person's intelligence, attention and memory, according to an international research team.

Among a long-range study cohort of more than 1,000 New Zealanders, individuals who started using cannabis in adolescence and used it for years afterward showed an average decline in IQ of 8 points when their age 13 and age 38 [IQ tests](#) were compared. Quitting pot did not appear to reverse the loss either, said lead researcher Madeline Meier, a post-doctoral researcher at Duke University. The results appear online Aug. 27 in PNAS.

The key variable in this is the age of onset for marijuana use and the brain's development, Meier said. Study subjects who didn't take up pot until they were adults with fully-formed brains did not show similar mental declines. Before age 18, however, the brain is still being organized and remodeled to become more efficient, she said, and may be more vulnerable to damage from drugs.

"Marijuana is not harmless, particularly for [adolescents](#)," said Meier, who produced this finding from the long term Dunedin Multidisciplinary Health and Development Study. The study has followed a group of 1,037 children born in 1972-73 in Dunedin, New Zealand from birth to age 38 and is led by Terrie Moffitt and Avshalom Caspi, psychologists who hold dual appointments at Duke and the Institute of Psychiatry at King's College London.

About 5 percent of the study group were considered marijuana-dependent, or were using more than once a week before age 18. A dependent user is one who keeps using despite significant health, social or family problems.

At age 38, all of the study participants were given a battery of psychological tests to assess memory, processing speed, reasoning and visual processing. The people who used pot persistently as teens scored significantly worse on most of the tests. Friends and relatives routinely interviewed as part of the study were more likely to report that the persistent cannabis users had attention and memory problems such as losing focus and forgetting to do tasks.

The decline in IQ among persistent cannabis users could not be explained by alcohol or other drug use or by having less education, Moffitt said.

While 8 IQ points may not sound like a lot on a scale where 100 is the mean, a loss from an IQ of 100 to 92 represents a drop from being in the 50th percentile to being in the 29th, Meier said. Higher IQ correlates with higher education and income, better health and a longer life, she said. "Somebody who loses 8 IQ points as an adolescent may be disadvantaged compared to their same-age peers for years to come," Meier said.

Laurence Steinberg, a Temple University psychologist who was not involved in the research, said this study is among the first to distinguish between cognitive problems the person might have had before taking up marijuana, and those that were apparently caused by the drug. This is consistent with what has been found in animal studies, Steinberg added, but it has been difficult to measure in humans.

Animal studies involving nicotine, alcohol and cocaine have shown that

chronic exposures before the brain is fully developed can lead to more dependence and long-term changes in the brain. "This study points to adolescence as a time of heightened vulnerability," Steinberg said. "The findings are pretty clear that it is not simply chronic use that causes deficits, but chronic use with adolescent onset."

What isn't possible to know from this study is what a safer age for persistent use might be, or what dosage level causes the damage, Meier said. After many years of decline among US teens, daily [marijuana](#) use has been seen to increase slightly in the last few years, she added. Last year, for the first time, US teens were more likely to be smoking pot than tobacco.

"The simple message is that substance use is not healthy for kids," Avshalom Caspi said via email from London. "That's true for tobacco, alcohol, and apparently for cannabis."

More information: "Persistent Cannabis Users Show Neuropsychological Decline From Childhood to Midlife," Madeline H. Meier, Avshalom Caspi, et al. *Proceedings of the National Academy of Sciences*, Online Early Edition, Monday, Aug. 27, 2012.

Provided by Duke University

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