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## **Marijuana Use Linked to Increased Loss of Brain Volume in Patients with Schizophrenia** *Long-Term AJP Study Demonstrates Effect of Ongoing Use*

**Arlington, Va.** – Patients with recent-onset schizophrenia who use marijuana (or other forms of cannabis) over a period of up to five years lose more brain volume, compared with patients who don't use cannabis. These decreases in brain volume appear over time as excessive loss of gray matter, along with corresponding increases in the volumes of both the third and lateral ventricles (two cavities within the brain).

These findings are revealed in a longitudinal study published online today by *The American Journal of Psychiatry (AJP)*, the official journal of the American Psychiatric Association. The report, "Excessive Brain Volume Loss Over Time in Cannabis-Using First-Episode Schizophrenia Patients" by Monica Rais, M.D., and colleagues at the University Medical Center in Utrecht, the Netherlands, is available under *AJP in Advance* (<http://ajp.psychiatryonline.org/pap.dtl>). The report will appear in print in the April 2008 issue of the journal.

Previous studies linking changes in brain volume with use of cannabis by patients who have schizophrenia either have used indirect measurements, or have relied on measurements at only one point in time. In contrast, in the current study, magnetic resonance imaging (MRI) scans of patients' brains were conducted twice, five years apart. Rais and her colleagues assessed cannabis use by subjects both before the study and during the follow-up interval. (Personal use of cannabis is legal in the Netherlands.)

"Cannabis abuse is common among persons with schizophrenia," said *AJP* Editor-in-Chief Robert Freedman, M.D. "Their reasons for its use may include some form of self medication for symptoms that they cannot otherwise control. However, the data in this study raise the possibility that its long term consequences may be quite harmful to their brains. There are few things that patients and their psychiatrists can do to prevent the loss of cognitive function associated with schizophrenia, but treatment and prevention of cannabis abuse would seem to be an important therapeutic goal."

In addition to the differences noted in brain volume loss, the 19 patients in the study who used cannabis during the five-year follow up showed less improvement in their symptoms of schizophrenia, compared with the 32 patients followed in the study who did not use cannabis. However, the two groups showed no difference in overall functional outcome or in the number of days of hospitalization during the five-year follow-up period. Within each group, the progression in brain volume loss was not related to differences in symptomatic or functional outcomes.

The patients' brain volume changes were also compared with those of healthy subjects who had never used cannabis. As expected, the healthy comparison subjects showed the smallest changes, on average, in brain volume over time. The changes in brain volume noted in patients with schizophrenia who did not use cannabis were found to be in between those noted in the cannabis-using patients and the healthy comparison group.

“Our study does not prove that cannabis use causes larger losses in brain volume over time,” noted Rais, the report’s lead author. “Although cannabis use might lead to excessive loss of brain volume, it is also possible that brain volume loss increases the likelihood of cannabis use. Even if cannabis use does lead to brain shrinkage, the effect may be indirect, for example through exacerbation of psychotic symptoms.”

Some research has suggested that psychotic symptoms themselves may be linked to brain damage that is exhibited by excessive loss of brain volume. Another possibility suggested by researchers ties excessive brain volume loss to patients’ noncompliance with antipsychotic medications, which some studies say may attenuate the progressive brain changes seen in patients with schizophrenia.

“Our results underline the importance of making a maximal effort to persuade patients with schizophrenia to stop using cannabis and warn young people in general about the possible risks associated with its use,” Rais added.

The study was funded by the University Medical Center Utrecht.

**Reference:**

Rais M, Cahn W, Van Haren N, Schnack H, Caspers E, Hulshoff Pol H, Kahn R: Excessive Brain Volume Loss Over Time in Cannabis-Using First-Episode Schizophrenia Patients. *Am J Psychiatry* (published online Feb 15, 2008; doi: 10.1176/appi.ajp.2007.07071110)

**Note to Editors:**

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