

Cannabis and Psychosis

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People have used cannabis, or marijuana, for thousands of years. Now, cannabis is the most widely used of all illicit drugs. Subjective experience from use of the drug ranges from relaxation and mood alteration to hallucination, and paranoia. These reactions are caused by changes in the brain as a result of cannabis' active ingredient, delta-9-tetrahydrocannabinol (THC), acting on receptors in areas such as the substantia nigra, hippocampus, cerebella cortex and cerebral cortex. There are several known effects of cannabinoid use such as harmful addiction and respiratory disease. However, research is now being conducted to determine if cannabis is linked to another harmful disease—psychosis.

The Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition defines psychosis as a disorder mostly characterized by delusions and hallucinations. A well-known form of psychosis is schizophrenia. The disorder, which literally means, “split mind” is a severe psychopathology characterized by emotional withdrawal, disturbances of thought, hallucinations and delusions. Approximately 1% to 2% of the United States population, or 2.2 million people, is estimated to suffer from the disorder. Geneticists have determined that schizophrenia has a genetic component; concordance rate between monozygotic twins is 48%. It is, therefore, important to understand the relationship between the use of cannabis and the occurrence of psychotic disorders such as schizophrenia.

Studies have clearly indicated a correlation between and the occurrence of psychosis and use of cannabis.

Researchers, however, disagree on whether cannabis leads to the onset of psychosis or if psychotic symptoms precipitate cannabis use. Patients who self-medicate psychosis with cannabis provide one gray area for investigators. Furthermore, researchers are still unsure of whether “skunk” and other potent forms of the drug contribute to a higher risk for developing psychosis later in life. For studies that rely on self-reported data, confounding variables come into play, clouding results. Thus, research to date remains somewhat inconsistent. Correlation does not show causation, warranting further study to determine the precise relationship between psychosis, especially schizophrenic-like behavior and symptoms, and the use of cannabinoid. This paper will review the current information on this relationship and the ways in which society is interpreting the implications of the scientific data. Although research has not yet produced definitive results, most studies thus far have shown increased risk for schizophrenia in

cannabis users when compared with infrequent users or non-users of the drug, especially for individuals with a predisposition for the disorder.

A 2007 review study collected data from 4,804 longitudinal and population based studies. Investigators examined suicidal thoughts, anxiety, and affective disorders, such as depression, separately. Although results of the review suggested an increase risk of any psychotic disorder in individuals who used cannabis more frequently, there were less consistent findings. Non-causal explanations were not fully addressed. There was a substantial confounding effect for both psychotic and affective outcomes.⁷

A separate review study conducted by Denghardt and Hall aimed to look at vulnerable individuals' risk in particular. Through an examination of longitudinal studies with a population sample of adolescents and young adults, potential confounders such as other drug use, and personal characteristics were controlled. Biological plausibility was also examined. The results from six studies conducted in five different countries suggested more conclusive results. Researchers found that cannabis use predicts an increased risk of schizophrenia diagnosis or of reporting symptoms of psychosis. Additionally, results seemed to not be a result of cannabis use to self-medicate previously existing symptoms of psychosis. Increased risk was more likely to be a result of personal or family history of schizophrenia.

BBC recently commented on a December 2010 report that suggests using cannabis as a teenager or a young adult increases the risk of psychosis. Published in the *British Medical Journal* (BMJ), the ten year study was conducted in Germany and tracked 1,923 people from the general population

who were between 14 and 24 years of age at the baseline. To determine the causal relationship between psychotic disorders and cannabinoid use, researchers performed a prospective population based cohort study. Investigators followed-up with participants at several points during the ten year time period, including 3.5 years after the start of study (T2) and 8.4 years after the baseline reports (T3). For participants with no lifetime psychotic symptoms and no reported lifetime use of cannabis at the baseline, incidence of cannabis use over the period from baseline to T2 increased the risk of developing psychotic symptoms later observed from T2 to T3. Results also suggest that continued use of cannabis can increase the risk of persistent psychotic symptoms over the period from T2 to T3. By impacting on the persistence of symptoms reminiscent of psychotic disorders, cannabis use may be a dangerous risk

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psychotic symptoms.⁴

An editorial by Wall and Denghardt published in the *British Medical Journal* in response to this study and other similar investigations found that research points to cannabis precipitating schizophrenia in vulnerable people because of personal or family history for the disorder. In a prospective double blind provocation study, researchers intravenously exposed participants to tetrahydrocannabinol. Researchers found cannabis triggers both the positive and negative symptoms of schizophrenia in a dose dependent manner in both healthy individuals and individuals diagnosed with schizophrenia. Another study found patients with schizophrenia who use cannabis have more psychotic symptoms.

Furthermore, participants classified as regular cannabis users increased their risk for developing schizophrenia by two or three fold. Hall and Denghardt also illustrated that 7 in every 1000 cannabis users are likely to develop symptoms. However, there is an increased risk for regular cannabis users (14 in 1000). A dramatic increase in risk exists for people with a family history of psychotic symptoms. It is estimated that 1 in every 10 individuals that fall under this category are likely to develop schizophrenia as a result of cannabis use.⁵ Such alarming statistics show the importance of studies focused on determining the exact relationship between cannabis use and schizophrenia.

There are important implications that must be taken into consideration as a result of these studies. One possible way to battle this problem is to prevent adolescents from using the drug. A modeling study estimated that between 2,018 and 4,530 young people need prevention from regularly using the drug in the United Kingdom to prevent any cases of schizophrenia. For those who use the drug less frequently, the estimate is four to five times greater; 10,000 to 23,000 individuals must be prevented from taking the drug. A second way in which people can take results of these studies and apply them is through education.

Adolescent use of cannabis is associated with poor education outcomes, increased use of other illicit drugs, increased risk of depression and poor social relationships in early adulthood. If young people and adolescents are educated on the risks of illicit drugs, especially cannabis, the prevalence of psychosis that is related to cannabis use may be decreased. It is questionable whether or not government policy and classification of cannabis has a positive effect on decreasing cannabis use.⁴ It is interesting to note that about four years ago in July 2007, the British government considered reversing their policy on cannabis. Cannabis had been downgraded from a class B drug to a class C drug. "Weak" evidence on cannabis' causal relationship to psychosis convinced many that the government need not reverse the decision.⁶

Hall and Denghardt further explored the implications of scientific findings on the reuse of cannabis as a contributing cause of the onset of psychosis. They compared analyses of similar evidence for the harmful effects of other addictive substances such as alcohol, tobacco, and amphetamine. Researchers concluded that evidence for the causal relationship between cannabis use and psychotic symptoms was as strong as evidence for heavy alcohol use and amphetamine

use and psychosis in young adults. Researchers concluded similarly; cannabis use should be discouraged in adolescents and young adults. People must be informed of the potentially hazardous consequences of cannabis use. Caution must be used when considering more lenient legal policies.⁷

The effects of cannabis use on the development of psychosis later in life is an ongoing research subject. As the most widely used illicit drug, cannabis must be properly regulated to keep all individuals safe from its potentially harmful effects. Whether the risk is greater in young people or people predisposed to psychotic disorders, cannabis poses dangers to all who abuse it. Research that aims to find the exact causal relationship expressed by clearly established correlations are important steps in the process of properly regulating and using this drug, in addition to knowing the ways in which cannabinoids affect the structure and function of the brain. Psychotic disorders affect millions of people around the world. This research is not an issue that should be taken lightly. It is important that scientists and officials and administrators alike properly understand the biological bases behind the disorders that drugs such as cannabis may cause.

Parents Prefer Genetic Testing

By Mark Leiserson

A recent study has shown that parents are likely to have their kids genetically tested for adult diseases, providing evidence that parents generally believe the benefits of early genetic testing outweigh the costs.

Testing for common genetic diseases is becoming more and more mainstream as associations between genetic traits and disease continue to be found. However, this study only examined diseases with prevention strategies, as the utility of genetic testing non-preventable diseases continues to be questioned. In the study, parents were given the option of applying a genetic test to their children that could detect different preventable, early-onset adult diseases. Generally, the benefits of providing such a test to those with a genetic susceptibility to a disease with prevention strategies is the ability to take early preventative steps. The associated costs are "invasion of privacy and psychological discomfort".

Future studies will be required to determine the generalizability of these results, especially since the "offer of child genetic testing was hypothetical, and participants received incentives for completing online surveys". In addition, studies of children's attitudes towards genetic testing should also be conducted.

References

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