

Same genes found to be related to both cannabis use and serious mental disorders

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The relationship between cannabis use and psychiatric disorders has been widely debated.

Cannabis is a psychoactive and addictive drug which sometimes produces psychosis-like symptoms. Psychiatric disorders such as schizophrenia and [bipolar disorder](#) are characterized by a severely disturbed perception of reality or a state of confusion.

In a new study, researchers have shown that there are shared [genetic factors](#) underlying our susceptibility to both [cannabis](#) use and some [psychiatric disorders](#). The study has been published in *The Lancet Psychiatry*.

"These findings may indicate that a subgroup of the population is at high risk for both cannabis use and certain psychiatric disorders, based on their genetics," says Weiqiu Cheng.

She was first author of the study together with Nadine Parker. At the time of the study, they were both researchers at the Norwegian Center for Mental Disorders Research (NORMENT), a Centre of Excellence at the University of Oslo.

Genetics play an important role

Individuals who use cannabis have a threefold risk of developing psychosis. Lifelong use of cannabis may also lead to the development of bipolar disorder.

"We know that genetic factors affect an individual's likelihood of using cannabis. We also know that genetic factors play an important role in determining an individual's susceptibility to developing psychiatric disorders," says Cheng.

What else can genetics tell us?

Genetic variants are differences in the DNA code between different individuals. When we talk about genetic variants associated with, for example, a particular psychiatric disorder like schizophrenia, it indicates that this [variant](#) may increase or decrease a person's risk of developing that particular disorder.

"Previous research have shown that some of the genetic variants associated with cannabis use are also linked to psychiatric disorders," says Cheng.

In other words, there is a genetic link between the use of cannabis and some psychiatric disorders. Thus, the researchers at NORMENT wanted to explore this genetic link even further with this study.

Explains why some are more susceptible than others

"The study helps to explain why some individuals are more susceptible to both cannabis use and certain psychiatric disorders," says Nadine Parker, postdoctoral fellow at NORMENT.

Because not only is there a link between the genetic variants. It is actually the same genetic variants that cause a person's susceptibility to both using cannabis and developing psychiatric disorders, such as schizophrenia and bipolar disorder.

"These findings are important as they show that the complex links between cannabis use and these disorders may not only be caused by cannabis use itself, but could also be driven by shared genetic susceptibility," Parker explains.

Preventive measures aimed at people at high risk is needed

These new findings have important clinical implications, according to Cheng and Parker.

"We can use the information from the study to develop [preventive measures](#) aimed at people at high risk. This could, for example, be to reduce cannabis use among people with a high genetic risk of schizophrenia and bipolar disorder," Cheng says.

Information about shared genetic variants can also contribute to the development of more targeted treatment efforts.

"Our improved knowledge about genetic overlap, could be used to stratify patients for more specialized treatment plans," Parker says.

Some genetic variants have opposing effects on cannabis use and psychosis

The results of the study showed that the majority of the shared gene variants increase the risk of both cannabis use and the development of either schizophrenia or bipolar disorder.

However, the researchers at NORMENT also found some genetic variants with the opposite effect on cannabis use and mental disorders.

"We also found gene variants that increase the risk of cannabis use, while decrease the risk of the two psychiatric disorders. This finding suggests a complex relationship," says Cheng.

Cannabis a potential treatment for psychosis?

This discovery of a large number of genetic variants that have the opposite effect on cannabis use and psychosis is also worth noting.

Cannabis is used medicinally for relief pain and as an antidepressant in some regions of the world. One component of cannabis is also being considered as a potential treatment for psychosis.

Among patients with disorders linked to psychosis, such as schizophrenia and bipolar disorder, the rate of cannabis use is higher than in the general population.

Shared genetic variants with opposing effects may suggest the presence of biological mechanisms that could support the beneficial effects of cannabis, the researchers point out.

Advanced statistical methods used in the study

To explore the genetic association between the [psychotic disorders](#) and the use of cannabis, the researchers from NORMENT used advanced statistical modeling.

"We leveraged the latest genetic evidence for cannabis use, schizophrenia, and bipolar disorder in analyzes using state of the art methods that assess genetic overlap, causality, and prediction," says Parker.

The analysis was based on results of previously conducted [genome-wide association studies](#) on schizophrenia, bipolar disorder, cannabis use disorder, and lifetime [cannabis use](#). Combined, these studies were comprised of over 1 million participants. Genetic information from these previous studies was used to conduct the current analyzes.

More information: Weiqiu Cheng et al, The relationship between cannabis use, schizophrenia, and bipolar disorder: a genetically informed study, *The Lancet Psychiatry* (2023). [DOI: 10.1016/S2215-0366\(23\)00143-8](#)

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