It's lack of balance that makes skunk cannabis do harm

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THE effects of cannabis on mental health have attracted much attention over the years. As far back as the 19th century it was recognised that cannabis could induce a transient psychosis which mimics the symptoms of schizophrenia. Despite this, until the last decade or so, most psychiatrists regarded cannabis as essentially benign.

This, however, is at odds with recent research which concludes that in a susceptible minority, cannabis use can push the brain towards long-term psychosis requiring mental health treatment. Susceptible young people who use cannabis increase their risk of developing a chronic psychotic disorder such as schizophrenia, and the more cannabis they consume, the higher the risk.

Additionally, people with schizophrenia who have a history of cannabis use tend to go through their first breakdown up to five years earlier in life than those who do not use the drug. Psychotic patients who fail to give up cannabis experience more symptoms, more relapses and end up in hospital more often.

These discoveries about the link between cannabis and psychosis have been widely reported in the media, often accompanied by warnings that street cannabis has risen in strength in recent years and therefore poses a major health risk to the susceptible minority.

This, however, is too simplistic: the type of cannabis taken is an important factor. Street cannabis has indeed changed over the years. So-called "skunk" does contain higher than normal concentrations of the main psychoactive compound, a molecule called delta-9-tetrahydrocannabinol (THC). What is less well known is that another constituent, cannabidiol (CBD), has been eliminated from skunk through selective breeding to increase the THC content.

The elimination of CBD may play a key role in the development of psychosis. Laboratory studies have shown that pure, synthetic THC causes transient psychosis in 40 to 50 per cent of healthy people. In stark contrast to THC, CBD appears to have an anti-psychotic effect, at least in animals. Studies in humans, though few in number, have produced similar findings.

The elimination of cannabidiol from skunk may play a key role in the development of psychosis

In one human study, published in *Neuropsychopharmacology* (DOI: 10.1038/npp.2009.184), Sagnik Bhattacharya and colleagues at the Institute of Psychiatry in London used functional MRI brain scanning to study the effects of THC and CBD on the brains of healthy volunteers. They found that THC and CBD acted in opposition; in brain regions where THC increased neural activity from a baseline, CBD decreased it, and vice-versa.

In a further experiment, a group including one of us (Morrison), in collaboration with the Beckley Foundation, compared the effects of a mixture of synthetic THC and CBD, (to mimic traditional

cannabis) with THC on its own (to mimic skunk). The aim was to find out if CBD offered protection against the psychotic effects of THC.

Healthy volunteers were given the molecules intravenously for two sessions. They received the same amount of THC during each session; the only difference was whether they received CBD as well. Thirty minutes after injection a consultant psychiatrist interviewed the volunteers and rated their experiences. Overall, volunteers were rated as being significantly less psychotic after being given THC and CBD compared to THC on its own. The implication is that the presence of CBD in cannabis counteracts THC's tendency to trigger transient psychosis.

Another study from the Institute of Psychiatry by Marta DiForti and colleagues reached similar conclusions for chronic psychosis. They compared the cannabis habits of 280 newly diagnosed psychotic patients with those of 174 healthy volunteers who were matched for age, sex, educational attainment and socio-economic status. Both groups were equally likely to have tried cannabis, but, strikingly, psychotic patients were seven times more likely to have been skunk users. So in real life, as well as in the lab, THC unopposed by CBD appears to be particularly hazardous for mental health (*British Journal of Psychiatry*, vol 195, p 488).

This research has important implications for both street and medical marijuana. On the medical side, the question is whether CBD will be a useful antipsychotic in its own right.

To help find out, the Beckley Foundation is setting up a research project in collaboration with University College London and a leading medical marijuana dispensary in California which supplies over 30,000 patients. The study will analyse different strains of cannabis for their THC and CBD content. Patients will be asked which strains they find most effective, how they compare with conventional drugs, and to rate other effects, both beneficial and negative.

As for street cannabis, the Beckley Foundation hopes that this research will be used to make it safer. Skunk, with a typical THC content of 15 to 19 per cent and a CBD content of zero, has come to dominate the street market. Ironically, many consider skunk's market dominance to be a consequence of prohibition, as illegal drug markets have always tended towards higher potencies.

The Beckley Foundation sees this as yet another argument for regulating the recreational cannabis market. Only in a regulated market can the knowledge from this research be used to create strains which are less hazardous for users.

The evidence supports the idea that nature knows best, and that the reintroduction of CBD would be beneficial. Two molecules are better than one.

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