Report Title: Cannabis, Psychosis and the Vulnerable

Introduction

'Just ONE cannabis joint 'can bring on schizophrenia' [1] Well, so the headlines of the United Kingdom's Daily Mail declared. Is this just a sensational 'info byte' from some obscure study or was it yet another key piece of research adding to the growing body of evidence empirically affirming what we have anecdotally known all along – that Cannabis is a brain damaging psychoactive substance?

The growing propaganda that 'weed' was harmless had regained credibility in the late 20th Century and early 21st Century. The paladin purveyors of pot were getting traction with the move to decriminalise and, of course, the current trump card of *'Mary Jane as Medicine'* had the wilfully ignorant in a giddy expectation of 'happiness in a toke'. However, the wheels began to fall off with, as stated, the advance of science. There was a growing body of evidence that suggested the previously dismissed 'mood moments' of Cannabis use, were much more than that and that this purportedly 'natural' high was having devastating effects.

The Australian Government released a parliamentary Research Note on this issue back in 2007. In the release they noted the mood altering properties of cannabis and even reported in 'matter of fact' terms about the quasi-psychotic state induced by using cannabis. However, they went one step further to table a number of hypotheses that researchers had posited about the psychosis inducing properties of this perfidious plant. The following hypotheses…

I. *Cannabis use causes mental health problems (the 'causal hypothesis'). This hypothesis encompasses two possible scenarios: scenario a) cannabis use may cause a psychotic disorder (a distinct 'cannabis psychosis') that would not have occurred in the absence of cannabis use and, scenario b) cannabis use may precipitate schizophrenia or exacerbate its symptoms.*

II. *Cannabis use may exacerbate the symptoms of psychosis.*

III. *Cannabis use is a consequence of mental health problems (the 'self-medication hypothesis).*

IV. *Cannabis use and mental health problems may coincide as a result of common variables (the 'common cause hypothesis').*[2]

It's important to note that in only a few short years these hypotheses have been tested and pushed more from the realm of theory to established medical fact – particularly hypotheses I(b) and II shown above.

> *Researchers at the University of Bristol had, for the first time, looked in detail at the changes in the brains of cannabis users. They found the drug disrupts the same parts of the brain as the psychotic illness, those associated with memory and decision-making. Smoking just one cannabis joint can bring on symptoms of schizophrenia. Cannabis abuse has previously been linked with increased rates of schizophrenia but this is the strongest evidence yet that the drug mimics its effects… Using electrodes embedded into [rats] brains – which cannot be done in humans – they found those who had the drug were 'significantly impaired' in carrying out tasks for up to two hours afterwards… Two parts of their brain were shown to be affected - the hippocampus which is essential for forming new memories and prefrontal cortex which integrates those memories and uses them for future behaviour and decision-making. Disruption of the brain waves which allow these two areas to communicate is what happens in schizophrenia, a mental disorder… An analysis of 83 studies earlier this year involving 22,000 young people, concluded that smoking cannabis can accelerate the onset of psychotic illnesses by several years making them harder to treat successfully.* [1]

Brain Impact

As scientific investigative capabilities have increased, so (as we have just read) has the ability to map and measure the impact on not only brain function, but size and compartments.

In June 2008 researchers from Australia's University of Melbourne were able to detect serious changes to brain physiology in long term cannabis users.

Lead researcher Murat Yucel, from the ORYGEN Research Centre and the Melbourne Neuropsychiatry Centre reported to *HealthDay* Reporter Steven Reinberg *"… this study shows long-term, heavy cannabis use causes significant brain injury, memory loss, difficulties learning new information, and psychotic symptoms, such as delusions of persecution [paranoia], delusions of mind-reading, and bizarre social behaviours in even non-vulnerable users."* [3]

What is also important in this study was that it was the first of the new 'evidence based' studies to, and I quote Yucel again… *"…show that long-term cannabis use can adversely affect all users, not just those in the high-risk categories such as the young, or those susceptible to mental illness, as previously thought,"* [3]

This research was conducted carrying out high-resolution MRI's on a group of men who smoked more than five joints a day for 10 years and juxtaposed this test group with a control group of similar men who did not use cannabis. The results were concerning. The evidence clearly revealed that the cannabis users had reduced brain volumes in both hippocampus and amygdala. The measurable difference in the size of these vital brain components was between 7 and 12 % smaller. This significant reduction takes on even weightier concerns when we understand that these vital brain components regulate emotion, memory and help control fear and aggression.

In late 2011 similar studies into cannabis use on brain function were undertaken at the Institute of Psychiatry at King's College London. The brain imaging studies led by Professor Philip McGuire and Dr Sagnik Bhattacharyya enabled the researchers to differentiate the effect that the different chemical constituents of Cannabis had on the brain. This study used a sample group of 15 healthy males who were only occasional cannabis users. The researchers wanted to examine the specific influence that both THC and CBD in cannabis would have on brain function. The results, published in the January 2012 issue of the *Archives of General Psychiatry*, only added to growing evidence based data of Cannabis' damaging effects…

> *The authors used functional MRI imaging to study each participant on three occasions after administration of THC, CBD or a placebo. They then performed a visual oddball detection task so that researchers could understand the importance each individual attached to specific stimuli.*
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> *THC significantly weakened the activation of the striatum and increased the activation of the lateral prefrontal cortex. The effect in the striatum was a result of THC increasing individuals' response to normally insignificant stimuli, and decreasing its response to significant stimuli. The findings help explain why smoking cannabis can result in feelings of paranoia, or in the most extreme cases, psychotic episodes, as individuals attach special importance or meaning to normally insignificant experiences or stimuli..*[4]

Psychosis and the Young

"Heavy cannabis use starting at a young age carries a very much greater risk than modest use as an adult." [5] So declared Dr. Matthew Large, a senior staff psychiatrist at Prince of Wales Hospital in Sydney when commenting on his published data *Cannabis Use and Earlier Onset of Psychosis A Systematic Meta-analysis* in *Archives of General Psychiatry* Vol. 68 No. 6, June 2011.[6]

> *This meta-analysis (where researchers combine data from numerous related studies) looked at 83 peer-reviewed articles involving almost 8,200 individuals who had used marijuana or other drugs and almost 14,400 individuals who had not. People who smoked pot developed psychosis 2.7 years earlier than people with psychosis who did not smoke pot.* [5]

Summary Reflection

In summary, despite recent media coverage suggesting that marijuana gives a person a "natural high", recent medical research is showing that all cannabis users are more vulnerable than previously thought, and those who are most at risk of psychological damage from cannabis use are the young and those susceptible to mental illness.

A positive first step in addressing these findings has been proposed in a public release by the University of New South Wales where the authors of an article on psychotic illness conclude that: *"The results of this study provide strong evidence that reducing cannabis use could delay or even prevent some cases of psychosis…The results of this study confirm the need for a renewed public health warning about the potential for cannabis use to bring on psychotic illness."*[7]

Each of us can do our part in sharing this reliable and reputable information. It is imperative that politicians and community leaders heed this message and take positive actions through legislation, better regulation, education and proactive social action against illicit drugs, aiming to make our country a safer and healthier drug reduced place, thereby protecting the mental health and psycho-social development of our youth and improving the wellbeing of our diverse communities across Australia.

Compiled by **Shane Varcoe, Director, Dalgarno Institute and Derek Steenholdt - Research Officer**

References

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