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Long-term cannabis use causes brain injury

New ground-breaking research shows long-term, heavy cannabis use causes significant brain abnormalities resulting in psychotic symptoms and memory loss equivalent to that of patients with a mild traumatic brain injury.

The study is the first to 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.

The research, conducted by ORYGEN Research Centre and Melbourne Neuropsychiatry Centre at the University of Melbourne in collaboration with researchers at the University of Wollongong was published today in the prestigious American journal *Archives of General Psychiatry*.

The researchers used brain imaging to demonstrate for the first time that the hippocampus and the amygdala, brain regions thought to regulate memory and emotional processing, were significantly reduced in cannabis users compared to non-users by an average of 12 per cent and 7 per cent, respectively.

According to lead researchers Dr Murat Yücel and Dr Nadia Solowij, the new evidence plays an important role in further understanding the effects of cannabis and its impact on brain functioning.

“The study shows that long-term cannabis users were more prone to a range of psychotic experiences, such as persecutory beliefs (paranoia) and social withdrawal” Dr Yücel said.

Dr Solowij from the University of Wollongong said “It also demonstrates that these long-term users had progressed the loss of memory by around 15 years. With an average age of 39, the trial group had the memory capabilities of a 55 year-old. This loss of memory could be likened to the damage suffered by patients with mild traumatic brain injury”.

“Although growing literature suggests that long-term cannabis use is associated with a wide range of adverse health consequences, many people in the community, as well as cannabis users themselves, believe that it is relatively harmless and should be legally available. Given that cannabis is the most prevalent illicit drug in our community, there is a clear need to conduct robust investigations that highlight the possible long-term dangers,” Dr Yücel said.

The testing involved high-resolution structural magnetic resonance imaging on 15 men (average age 39 years) who smoked more than five joints daily for over 10 years. Their results were then compared with images from 16 individuals (average age 36) who were not cannabis users. All participants also took a verbal memory test and were assessed for subthreshold (below the standard of disease diagnosis) symptoms of psychotic disorders, which include schizophrenia and mania.

The more cannabis used, the more these individuals were likely to show reduced brain volume, particularly of the hippocampus, as well as sub-threshold psychotic symptoms and significant memory loss.

“These findings challenge the widespread perception of cannabis as having limited or no harmful effects on brain and behaviour” said Associate Professor Dan Lubman, an Addiction Medicine specialist at Orygen Youth Health and co-investigator on the study. “Young people in particular, need to be aware of the strong relationship between cannabis and mental health problems. That is why, in partnership with the National Cannabis Prevention and Information Centre, we are currently developing guidelines and resources for young people, teachers and their parents to help address this issue.”

“Although modest use may not lead to significant neurotoxic effects, these results suggest that heavy daily use might indeed be toxic to human brain tissue.” said Dr Yücel. “Further research is required to determine the degree and mechanisms of long-term cannabis-related harm and the time course of neuronal recovery after abstinence.”

Note

If you are concerned about your cannabis use, or use by a friend or family member, call the Cannabis Information and Helpline on 1800 30 40 50.

Please note Dr Murat Yucel is available for radio and TV interviews

Further Information Contact
Lisa Mulhall, Media Relations
Orygen Youth Health
0412 555-063.