

Forgot with Pot: Dissociative Amnesia Associated with Cannabis Use in an Adolescent Male

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Background:

- Cannabis (also known as marijuana) is a psychoactive drug with recreational and medicinal uses. Its primary psychoactive constituent is THC.
- Cannabis, including THC, acts on the endocannabinoid system in the brain, involved in cognition, memory, stress response, and emotional control.
- The endocannabinoid system is still developing in adolescents, making adolescent brains particularly vulnerable to the effects of THC.
- The effects of cannabis can range anywhere from euphoria and relaxation, to anxiety and paranoia. Cannabis use may also sometimes lead to dissociative states such as depersonalization and derealization, though these effects typically resolve within hours.
- Dissociative amnesia may be a rare but serious adverse effect of cannabis use, especially for adolescents whose developing brains may make them particularly vulnerable to cognitive effects.
- According to DSM-V, dissociative amnesia is defined by "an inability to recall important autobiographical information, usually of a traumatic or stressful nature, that is inconsistent with ordinary forgetting".
- DSM-V discusses that dissociative amnesia is not attributable to the physiological effects of a substance, for instance, a drug of abuse. However, this case highlights an instance where a clinical state most aptly described by dissociative amnesia may be attributed to substance use. In this particular case involving cannabis use, the symptoms persisted beyond the expected physiological effect of cannabis.
- As cannabis use grows, especially with recent local legalization in Nevada, it becomes more imperative for the medical community and general public to understand the risks, benefits, and potential side effects of cannabis.

Considerations:

- Despite our best efforts to obtain a full history, the history and data are limited due to the patient's communication difficulty and inability to describe his history.
- Most of the patient's background information was obtained from the patient's mother.
- Other psychoactive substances may have contributed to the patient's presentation, and it is unknown whether any other drugs were ingested intentionally or unwittingly.
- For example, synthetic marijuana, also known as "spice", is not detectable on urine drug screen, and could also account for some of the patient's presentation.
- Patient was detained in juvenile detention center for about 7 days prior to his presentation to our facility, and we were unable to obtain any medical or historical records from this period.
- Patient was treated with antipsychotics initially, which could potentially have anticholinergic side effects that may possibly contribute to cognitive impairment.

Case Presentation:

Subjective:

- This is a 17 year-old Hispanic male who was admitted to the state child & adolescent inpatient psychiatric hospital (DWTC) for what was initially described as a "psychotic breakdown".
- Per patient's mother, the patient was acting normal, without any paranoia, psychosis or mood symptoms the night of the incident. Patient's mother then asked patient to walk to the grocery store. While gone for a two hour period, the patient reportedly smoked marijuana.
- Two hours later, patient arrived home. Per patient's mother, he exhibited paranoia that some drug dealers were going to kill her and his brothers.
- A few days later, patient engaged in an altercation with his uncle, cutting his uncle with scissors.
- Following this incident, he was arrested and spent 7 days in detention, during which he developed amnesia, and was thus transferred to tDWTC
- **Past Psychiatric History:**
- Patient had no past psychiatric history and had never been hospitalized in an inpatient psychiatric hospital
- Had no prior psychotropic medication trials, and did not receive any psychotropic medications in jail
- Patient denied symptoms of PTSD, MDD, auditory hallucinations, visual hallucinations, as well as mania
- He only had one episode of paranoia during the time leading up to his arrest

Social History:

- Living in an apartment with mother and two younger brothers in Northern California
- Father not part of patient's life
- Single, never married
- No children
- Had no history of physical, sexual or emotional abuse in childhood
- No previous family history of psychiatric illness

Education:

- Patient was a junior in high school. Per patient's mother, patient was a straight A student, was on the honor roll, had a small group of friends, and never got in trouble at school

Substance Use History:

- No history of substance use prior to two weeks before the incident

Laboratory Tests During Hospital Course:

- During hospital course, patient was sent out to University Medical Center for a full medical clearance.
- He had extensive workup to look for medical etiologies of amnesia that were essentially within normal limits.
- MRI with and without contrast, EEG, CBC, CMP, TSH, free T4, CRP, ESR, magnesium, ammonia, phosphorus.

Mental Status and Presentation During Hospital Course:

- When first admitted to DWTC, patient exhibited profound confusion and amnesia.
- On admission, he could not recall his name, his mother's name, or where he lived. He further could not recall the name of the high school he attended, as well as what grade he was in. He appeared appropriately groomed, calm, guarded in his affect, loose in associations. He denied AH, VH as well as paranoia
- During hospital course, patient's mental status did not improve significantly
- He continued to exhibit profound confusion and amnesia. A previously straight A junior in high school in normal classes, patient had difficulty performing simple addition, such as 2+2, spelling CAT, and was not alert & oriented to time, date and place.
- He mostly sat on the unit quietly and did not interact with peers
- He ate his meals when prompted
- Despite patient's mother coming to visit him often, patient was not able to recall who she was and the name of his mother
- Patient was tried on low dose Abilify, and then switched to Risperdal. Neither of these medications had any therapeutic effect on the patient
- Patient attended school while at Desert Willow Treatment Center with little interaction
- He attended therapy groups with minimal response.
- After over a month of hospitalization, the patient was eventually discharged to a Neuropsychiatric Institute in Northern California, where mother resides

Discussion:

- Endocannabinoid receptors are still developing in adolescent brains, so disturbances to the endocannabinoid system during adolescence, such as from cannabis use, may lead to poorer cognitive and emotional outcomes in adulthood.
- Studies have shown that increased cannabis use in adolescents is associated with decreased amygdala and hippocampal volumes.
- Additional studies in rats have also shown that increased cannabinoid exposure leads to poorer performances on cognitive tasks.
- Dissociative amnesia represents a rare condition associated with severe cognitive dysfunction and memory loss, that is typically associated with trauma. However, in this case there was no evidence of prior trauma except for recent cannabis use.
- The severity and extended duration of symptoms, along with the age of the patient, make this case even more unusual.
- While long term cannabis use may be associated with cognitive impairment in adolescents, there is little data highlighting serious cognitive impairment with acute use.
- It is unclear what defines acute versus long-term deficits associated with cannabis use.
- Furthermore, there is little data highlighting guidelines for treatment or the impact of abstinence for such severe cognitive side effects associated with cannabis use. There is additionally a lack of data on the extent to which patients can regain prior levels of cognitive function with abstinence or treatment.

Conclusion:

- Cannabis is the most common illicit drug used by adolescents in the US.
- With the recent increase in legalization, utilization, and social acceptance of cannabis, adolescents may be even more likely than ever to experience the effects of cannabis.
- It is clear that cannabis affects adolescent brain health, but further research is required to elucidate the long-term cognitive effects and develop guidelines for management and prognosis.