Behavioral Manifestations of Cannabis Hyperemesis Syndrome: Insights from a Case Series

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Introduction

- Cannabis hyperemesis syndrome (CHS) is characterized by recurrent episodes of nausea, vomiting, and severe abdominal pain that is associated with a history of chronic cannabis use.
- There have been many studies demonstrating a substantial increase in CHS, cyclic vomiting, and other vomiting presentations after legalization of recreational cannabis (1).
- We report a case series of patients with CHS who present with new onset of behavioral symptoms, including agitation, anxiety, and bizarre behavior.
- Our goal is to spread awareness of this unique presentation of CHS, as it becomes a more common presentation in emergency rooms.

Cases

Three cases of suspected CHS, seen by the Consult-Liaison Psychiatry Team in 2023 at the Emergency Department (ED):

- Case #1: A 30 year old female with a diagnosis of Bipolar Disorder, not in treatment for many years, presented to the ED complaining of abdominal pain, nausea, excessive sedation and family's concern regarding "shaking."

❖ Notably agitated, restless, and self-inducing vomiting
❖ Labs and CT head were unremarkable
❖ Refused to provide a urine toxicology
❖ Husband confirmed daily use of cannabis, later patient admitted to cannabis use and also reported a similar presentation of CHS a few years ago
❖ Patient recovered with supportive care and time

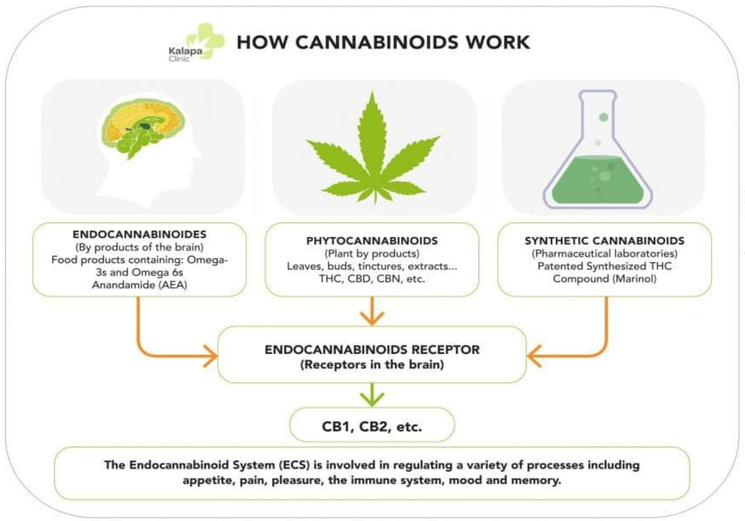
- Case #2: A 28 year old female with a past psychiatric history of Anxiety disorder, presented to the ED complaining of abdominal pain and nausea for two days.

❖ She was notably anxious, was seen shaking and kicking her legs, crawling on the floor, demanding water then vomiting the water
❖ Labs and CT head were unremarkable
❖ Denied cannabis use to providers, but patient's mother confirmed her smoking large quantities of cannabis daily
❖ Recovered with supportive care and time

- Case #3: A 25 year old female who was 26 weeks pregnant, with some past psychiatric history of Cannabis Use Disorder, presented to the ED with nausea, vomiting, abdominal pain, and acute agitation.

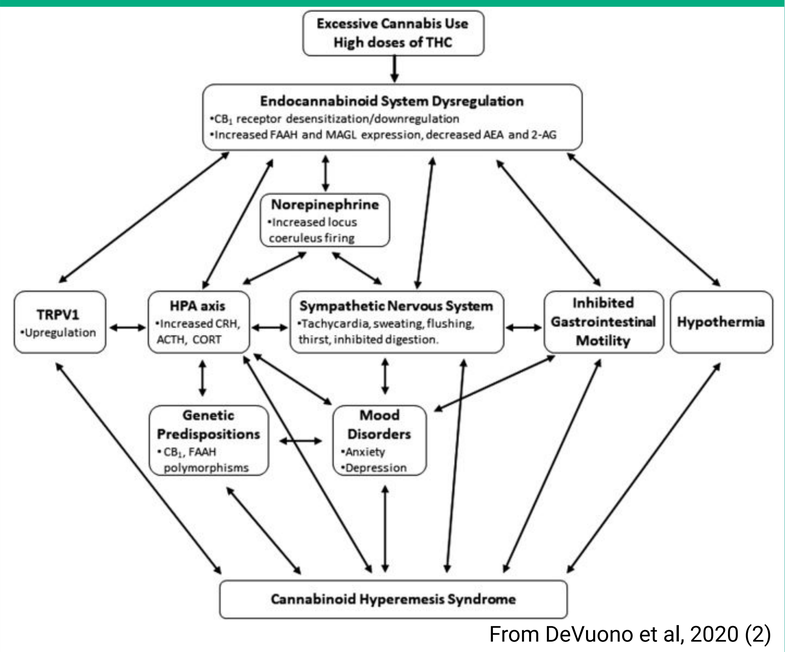
❖ Extremely agitated, answering questions minimally, and only stating "it hurts" and pointing to her abdomen.
❖ Multiple episodes of vomiting and escalating agitation, repetitive illogical behavior, going in and out of bed
❖ Given Ativan 2mg IM due to her agitation, decreased vomiting
❖ Labs: Utox positive for cannabinoids, increased lactic acid level, and ketones in the blood and urine. CT head deferred due to pregnancy
❖ Initiated on IV fluids, famotidine, metoclopramide, and topical Capsaicin cream to the abdomen.
❖ Admitted to regular marijuana use
❖ Recovered, and agreed to stop using marijuana

Figure 1



From Kalapa Clinic, 2021 (7)

Figure 2



From DeVuono et al, 2020 (2)

Discussion

- Proposed mechanisms for CHS: involves the endocannabinoid system (ECS) and the cannabinoid 1 (CB1) receptor (2, 4, 5)
- This receptor is located throughout the body, including the brain, immune system, lungs, and cardiovascular system and regulate stress and anxiety responses, thermoregulation, and neurotransmitter systems.
- The main components in cannabis that interact with this system are Δ9-tetrahydrocannabinol (THC) and cannabidiol (CBD).
- Naturally occurring endocannabinoids in the body, called anandamide (AEA) and 2-arachidonoylglyerol (2-AG) are involved with the ECS and the CB1 receptors.
- THC is a fairly potent, low efficacy agonist of the CB1 receptor, while 2-AG is a less potent, highly efficacious agonist. The consequences of these differences may be that THC compounds make less CB1 receptors available for endogenous 2-AG signaling.
- This **dysregulation of the ECS** is one of the hypothesized mechanisms of CHS. (2, 4, 5, 6)
- **ECS regulates the hypothalamic pituitary adrenal (HPA) axis**, and dysregulation may be associated with nausea and vomiting. The HPA axis also has a role in the stress response which we are hypothesizing contributes to agitated and bizarre presentations we observed here.
- **ECS dysregulation leading to sympathetic nervous system dysregulation** which directly causes hypertension, tachycardia, sweating, and thirst. This may explain the high levels of anxiety observed in the cases we describe here.
- One suggested hypothesis- contaminants like pesticides on the cannabis plant causing CHS is frequently mentioned in popular media, but there is a lack of evidence in empirical literature to back the claim, as pesticide poisoning presents differently than CHS. (2)

- **Recommended work-up for CHS**: metabolic panel, complete blood count, urinalysis, urine toxicology, urine pregnancy, EKG and CT/MRI brain. (3)
- **Recommended treatment of CHS**:
  - ***Cessation of cannabis use*** (most effective long term treatment)
  - ***Symptomatic Tx:*** antiemetics, benzodiazepines and anti-dopaminergic agents like haloperidol and droperidol.
  - ***Hot showers*** have also been found to relieve symptoms for some patients. (3)

Conclusion

- To our knowledge, these are some of the first reported cases of CHS associated with agitation and bizarre behaviors.
- As cannabis is legalized more widely, CHS may become a more common presentation, and it is important for providers to be able to recognize this unique presentation.
- These cases also highlight the importance of a thorough history in distinguishing these presentations from other psychiatric and medical diagnoses.

References

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Both authors have no disclosures to report.