Case Report

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Cannabinoid Hyperemesis Syndrome

Kriengsak Jaikla, M.D.[1], Kaset Chimplee, M.D.[2]

[1]Department of Psychiatry, School of Medicine, Mae Fah Luang University, Chiang Rai 57100, Thailand

[2]Department of Medicine, School of Medicine, Mae Fah Luang University, Chiang Rai 57100, Thailand

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Abstract:

Cannabinoid Hyperemesis Syndrome (CHS) is a condition characterized by cyclic episodes of nausea and vomiting, abdominal pain, and relief of symptoms by taking of hot shower, this syndrome being associated with chronic cannabis use. CHS occurs in approximately one-third of individuals presenting with cannabis use disorder. The pathophysiology of CHS is not fully understood, but it is believed to involve the endocannabinoid system (ECS). This report describes an 18-year-old female, with a history of marijuana consumption spanning nearly two years, who presented with intense nausea and vomiting. The patient made a complete recovery following cannabis abstinence and supportive treatment. Two months follow-up revealed a full resolution of the symptoms.

Keywords: Cannabinoid hyperemesis syndrome, Cyclic vomiting syndrome, Tetrahydrocannabinol

Introduction

Cannabis, a psychoactive drug derived from the Cannabis plant, is globally one of the most widely used recreational drugs.[1] The rise in cannabis use has contributed to an increased incidence of Cannabinoid Hyperemesis Syndrome (CHS). CHS is characterized by cyclic episodes of nausea, vomiting, abdominal pain, and relief of symptoms by taking of hot shower.[2] It is associated with chronic and excessive cannabis use.[3] The overall prevalence of CHS in the Western countries is 0.1% and is more common in young adults. The prevalence of CHS reaches 32% in patients with cannabis use disorder (CUD).[4] This syndrome is difficult to manage due to the limited efficacy of conventional antiemetics.[5] Abstinence from cannabis is the most effective treatment.[6] In this article, we describe a case of CHS in an 18-year-old female who presented with severe nausea and vomiting.

Case Presentation

A previously healthy 18-year-old Thai female presented with a three-day history of intense nausea and vomiting. The frequency of vomiting was recorded as being approximately 10 episodes per day.

Corresponding author: Kaset Chimplee, M.D.
School of Medicine, Mae Fah Luang University, Chiang Rai 57100, Thailand
E-mail: kaset.chi@mfu.ac.th

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She also reported feeling of lightheadedness. However, she did not manifest other clinical features such as abdominal pain, fever, vertigo, dysphagia, constipation, or diarrhea. She had experienced two similar episodes of lightheadedness during the past 4 months, which led to several visits to an outpatient and emergency department. Her ability to eat and drink was significantly affected. As a result, she had experienced an 11 kilogram weight loss in the preceding month. Symptomatic relief was sought by the patient, using warm bath, taken approximately four times daily.

Initially, the patient denied any history of illicit substance use. However, after several vomiting episodes, she admitted to the consumption of marijuana, quantified at 10-20 sessions daily over a nearly 2-year period. It was pertinent to note that within three months of initiating cannabis use, the patient began experiencing nausea without concomitant emesis. Despite discontinuing cannabis use for three weeks prior to hospital admission, the patient's symptoms persisted.

On hospital admission, the patient had blood pressure of 142/90 mmHg (mean arterial pressure of 107 mmHg), but other vital signs were normal. The physical examination was unremarkable. A laboratory urine screening test for tetrahydrocannabinol (THC) was positive. Blood tests, including complete blood count, glucose, basic metabolic panels, electrolytes, calcium, magnesium, phosphorus, blood urea nitrogen, and creatinine were within the normal range. Radiology and EKG examination also appeared normal.

Hospitalization was required in this patient due to severe recurrent episodes of vomiting and the history of failure of treatment as an outpatient. The diagnosis of CHS was made. The patient received symptomatic treatment, which consisted of hydration, antiemetic, and antipsychotics. Ten days after admission, the patient was discharged from hospital with psychoeducation to continue cannabis abstinence. She confirmed full resolution of vomiting and no further related symptoms at her two months follow-up appointment.

Discussion

Cannabinoid Hyperemesis Syndrome (CHS) is a condition characterized by intermittent periods of symptoms remission. There are 3 main phases of CHS: prodromal, hyperemetic, and recovery.[5-7] The prodromal phase can last for months or years with patients developing early morning nausea, vomiting, and abdominal discomfort. Patients may increase cannabis use for self medication. The hyperemetic phase usually lasts for a few days but may extend up to 10 days.[6] This phase is marked by intense vomiting, abdominal pain, and sympathetic overactivity, which often brings patients to the emergency department. Weight loss is common. Compulsive hot bathing behavior is reported to alleviate the symptoms. The recovery phase can last from days to months. Finally a resolution of symptoms is noted and the patients return to their baseline condition.[4,7]

The diagnosis of CHS depends on clinical characteristics and exclusion of other possible causes. Different criteria of diagnosis have been previously proposed. The currently accepted criteria are Rome IV criteria (Table 1).[8] Although this criteria is widely used, many studies have shown limitations in using the Rome IV criteria, as it provides limited information regarding the definition of chronic cannabis use and the duration of abstinence.[2,8] To enhance the diagnostic precision of CHS, The Cyclic Vomiting Syndrome (CVS) Guidelines Committee has proposed a revised set of criteria (Table 2).[8] However, our patient fits both diagnostic criteria.

Table 1 Rome IV criteria for Cannabinoid Hyperemesis Syndrome[9,10]

Must include all of the following: 1. Stereotypical episodic vomiting resembling cyclic vomiting syndrome (CVS) in terms of onset, duration, and frequency. 2. Presentation after prolonged excessive cannabis use. 3. Relief of vomiting episodes by sustained cessation of cannabis use.
Supportive remarks: • May be associated with pathologic bathing behavior (prolonged hot baths or showers).
Criteria fulfilled for the last 3 months with symptom onset at least 6 months before diagnosis.

Table 2 CVS Guidelines Committee for Cannabinoid Hyperemesis Syndrome[8]

Clinical features	Stereotypical episodic vomiting resembling CVS in terms of onset, and frequency ≥3 episodes a year.
Cannabis-use patterns	Duration of use >1 year preceding onset of symptoms. Frequency of use > 4 times a week on average.
Cannabis cessation	[a]Resolution of symptoms should follow a period of cessation from cannabis for a minimum of 6 months or at least equal to a duration that spans three typical cycles in an individual patient.

Note: [a]Patients unwilling or unable to abstain from heavy cannabis use pose a diagnostic challenge and may be considered as having CHS.

Treatment of chemotherapy induced nausea and vomiting was one of the first recognized medical uses of cannabis.[3] Nonetheless, using cannabis at a high dose can cause paradoxical hyperemesis. Several explanations for the pathophysiology of CHS have been suggested. There are two primary G protein-coupled CB receptors (CB1 and CB2) in the endocannabinoid system (ECS). CB1 receptors are located in the central nervous system (CNS) and gastrointestinal (GI) tract, where they influence appetite, gastric secretion, motility, cognition, and addiction. CB2 receptors are in lymphoid tissues and regulate the immune system.[2,3,11] The mainstream theory is that this syndrome is caused by ECS dysregulation. Chronic exposure to high-dose tetrahydrocannabinol (THC), the main psychoactive agent of cannabis and a partial agonist of CB1 receptors, overstimulates CB1 receptors, thereby causing desensitization and/or downregulation of the CB1 receptors. Changes in the ECS, which can trigger nausea and vomiting, affect various systems as follows: a reduction in endogenous cannabinoid via upregulation of degrading enzymes; disruption of the hypothalamic pituitary adrenal (HPA) axis and stress response; elevation of norepinephrine release and overactivation of sympathetic nervous system; upregulation of transient receptor potential vanilloid 1 (TRPV1); producing hypothermia; inhibition of GI mobility; and increasing gastric emptying time.[3,11]

The most effective treatment for CHS is cannabis cessation.[12,13] However, acute management is mainly supportive. Most patients come to the emergency department during the hyperemesis phase. Any life-threatening conditions and complications

of CHS need to be evaluated, such as hypovolemia, impaired consciousness, acute kidney injury and hypokalemia. If the patients are proven to have these conditions, hospital admission is necessary. Another benefit of hospitalization is that it acts as a mandatory cannabis cessation environment.[12,14] Intravenous hydration is usually required as part of the initial management.[5,12] Various antiemetic drugs are given to alleviate symptoms. Many studies have reported that common antiemetic drugs such as ondansetron (serotonin antagonist) and diphenhydramine (antihistamine) have low efficacy.[5,14-16] Capsaicin shows inconsistent results, both in its effectiveness and also a lack of standard dosage regimens.[6,17] Lorazepam (benzodiazepine) and haloperidol (antipsychotic, dopamine antagonist) are indicated as helpful medications.[4,5,11]

Conclusion

Although there are many studies about the cannabinoid hyperemesis syndrome, the exact pathophysiology has not been established, and the gold standard for diagnosis is still being developed. Prompt recognition is crucial to avoid unnecessary procedures, provide appropriate treatment, and prevent complications. Many supportive treatments have been found to have only limited efficacy. Therefore, psychoeducation and explanation regarding the plan of treatment, the doctor-patient relationship, and cannabis cessation advice are the keys to successful management.

Conflict of interest

The authors have no relevant conflict of interest to disclose.

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