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Evidence in Context

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Cannabis Hyperemesis Syndrome: What Do We Know?

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Defining Cannabis Hyperemesis Syndrome

A form of hyperemesis known as cannabis hyperemesis syndrome (CHS) has gained attention as a potential cannabis safety concern. CHS was first described as cyclical vomiting that occurred in individuals with prolonged cannabis use [1], but there is no official definition or criteria to diagnose patients with CHS at the time of this writing. CHS is considered a diagnosis of exclusion, and the American College of Gastroenterology describes common characteristics, which include the following [1–3]:

- Age <50 at the onset of symptoms
- Prolonged, regular cannabis use (>1 year for at least weekly)
- Abdominal pain
- Resolution of symptoms upon discontinuation of cannabis
- Compulsive hot showers/baths or symptom resolution with hot showers/baths
- Severe nausea and vomiting with episodes reoccurring over months
- Failure of symptom relief from traditional antiemetics
- Weight loss

The US surgeon general released a statement in 2021 warning of potential risk of CHS in chronic cannabis users that further advised caution when ingesting edibles, which have delayed effects that can result in overconsumption and thereby result in increased delta-9-tetrahydrocannabinol (THC) exposures [4]. Despite increasing awareness of CHS by clinicians, the mechanism explaining CHS development remains elusive. One proposed mechanism hypothesizes that THC potentially causes emesis by binding to cannabinoid type 1 receptors on the neurons that are in the vomiting center of the brain [5]. It is not clear how this would prompt cyclical vomiting, but THC (which is highly lipophilic) can cross the blood-brain barrier, resulting in potential accumulation of THC in the brain and overstimulation of receptors [5]. Another proposed mechanism suggests that genetic mutations interfering with cannabinoid metabolism lead to over-accumulation and adverse events like CHS [5].

In this piece, we identify studies and case reports that examine characteristics of patients with CHS and describe the trialed pharmacological and behavioral interventions, along with their successes and failures. We synthesize the developing CHS literature for clinicians to promote prompt CHS recognition and inform patients on risk. See the online supplemental material (for all online suppl. material, see https://doi.org/10.1159/000539182) for in-depth literature search and identification procedures, along with the full results of data extraction from reviewed studies.

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Table 1. Frequency and duration of cannabis use among CHS case reports and case series

	Participants, *n* (%)
Frequency of cannabis use	
Daily	21 (58)
Weekly	5 (14)
Not stated	8 (22)
Regular use (unspecified)	2 (5.6)
Duration of cannabis use	
One year	2 (5.6)
Greater than one year but less than ten	9 (25)
Greater than or equal to ten years	13 (36)
Not stated/unspecified	12 (33)

Characterization of CHS Cases

From 29 case reports and case series identified on CHS presentation as of 2024, representing 36 unique individuals, the ages of people represented in cases ranged from a low of 15 years old to a high of 47 years old [6–34]. Most reports (21 | 29) described frequency of cannabis use as daily or multiple times per day in cases. Most unique participants represented in case reports (24 | 36) used cannabis for 1 year or longer (see Table 1). Analytical observational studies and their characterizations of CHS cases are described in online supplementary materials [35–42].

Pharmacological Treatments Trialed for CHS

Most case reports included information on trialed pharmacological CHS treatments, and pharmacological treatments were not described for 15 individuals. The most frequently trialed pharmacological treatment was antiemetics, which also represented the pharmacological treatment failed most often, which is in line with CHS characterization (see Table 2 for specific agents within each medication class). Antipsychotics, anti-reflex medications, and hydration were reportedly trialed frequently in cases, but with no reported successful symptom resolution. No pharmacological treatment trialed, as documented in case reports and case series, resulted in complete symptom relief.

Behavioral Treatments Trialed for CHS

The majority of non-pharmacological or behavioral treatments trialed for CHS as documented among case reports and case series consisted of hot showers or baths, or similar applications of heat (see Table 3). Symptom relief was achieved in all cases where trial of hot showers is documented (26 | 26) and for the majority of cases (17 | 25) where behavior modification, consisting of cannabis smoking reduction, cessation, or switching cannabis formulations, was trialed. One case documented in reports described a patient that was referred in to a rehabilitation facility, and symptom resolution was not achieved in that case (0 | 1), nor in cognitive behavioral therapy (0 | 1). The specific amount of reduction in cannabis smoking that resulted in symptom resolution was not documented in cases with successful symptom relief, though all reports of trialed abstinence resulted in symptom relief.

Addressing CHS in Clinical Practice

Understanding of CHS and characterization of CHS epidemiology is still developing. All patients identified in case reports or case series were <50 years of age, when age was reported, and most were using cannabis daily at the time of symptom onset; however, it is unclear whether younger age is a risk factor for CHS development or whether younger adults with CHS-related symptoms were more likely to be considered as suitable for case report documentation. The most trialed non-pharmacological therapies were heat application via hot showers, baths, or heating pads, and behavior modification, where most of these trialed therapies resulted in symptom relief. Numerous medications were trialed in case reports and case series, with varying responses, and there was no consistent pharmacological treatment option resulting in definitive symptom resolution in most cases, though it should be noted that failed treatment with antiemetics appears to be a reliable indicator of CHS.

Clinicians can apply the commonalities from case presentation and management from these CHS cases to identify patients at risk for CHS and then can provide guidance on non-pharmacological, or pharmacological, treatment options when CHS is diagnosed or suspected. As increasing numbers of patients consume cannabis for medical and non-medical purposes, further guidance on risk communication for CHS will need to be developed, but first, diagnostic criteria will need to be formalized. Clinicians can consider using validated cannabis risk screening tools when determining whether education or intervention recommendations are appropriate in patients that report prolonged and frequent cannabis use.

Table 2. Pharmacological treatments trialed in CHS cases

Drug class	Specific medications/agents	Cases receiving treatment, *n* (%)*	Failed treatment in cases (%)*
Antiemetic	Droperidol, aprepitant, metoclopramide, promethazine, nabilone, prochlorperazine diphenhydramine, and unspecified antiemetics	10 (18)	48 (49)
Anti-reflux medications	Ranitidine, calcium carbonate, pantoprazole, unspecified proton pump inhibitor, and unspecified antacid	6 (11)	10 (10)
Anticholinergics	Dicyclomine and hyoscyamine	Not reported	3 (3.1)
Antidepressants	Amitriptyline, paroxetine, and sertraline	Not reported	3 (3.1)
Antispasmodics	Butyl hyoscine bromide	1 (1.8)	Not reported
Antipsychotic	Haloperidol	9 (16)	3 (3.1)
Antiepileptic	Lorazepam	3 (5.3)	2 (2)
Analgesic	Topical capsaicin, acetaminophen, tramadol, hydromorphone	5 (9)	9 (9.2)
Antibiotics	Ceftriaxone	1 (1.8)	1 (1)
Alpha 2 adrenergic agonist	Clonidine	Not reported	1 (1)
Anti-inflammatory	Corticoids	Not reported	1 (1)
Prokinetic (5-HT4 receptor agonist)	Tegaserod and prucalopride	Not reported	2 (2)
Alpha 1 blocker	Tamsulosin	1 (1.8)	Not reported
Vitamin D analog	Calcitriol	1 (1.8)	Not reported
Antidiuretic	Furosemide	1 (1.8)	Not reported
Hydration	Normal saline	4 (7)	9 (9.2)
Not stated	Not applicable	15 (26)	6 (6.1)

*Some case reports include more than one pharmacological strategy and so % may not sum to the 36 individuals represented in case reports and case series when calculating proportion of failed treatments or number of treatments trialed overall. In antiemetics, for example, multiple medications were often trialed within the same case. Not reported indicates that either the medication was not described as administered as definitive therapy or symptom status (resolution or not) following the medication was not described.

Table 3. Non-pharmacological treatments trialed in CHS cases

Non-pharmacological therapies attempted	Cases trialing therapy (%)[a]	Cases with symptom relief (%)[b]
Hot showers or other forms of heat application	26 (72)	26 (100)
Behavior modification[c]	25 (69)	17 (68)
Cognitive behavioral therapy	1 (2.7)	0 (0)
Drug rehabilitation facilities	1 (2.7)	0 (0)
Motivational enhancement therapy	1 (2.7)	0 (0)
Not stated	7 (19)	Not applicable

[a]People in cases that used the non-pharmacological therapy divided by the total number of unique individuals in cases (36). [b]The denominator is the number of unique individuals trialing that therapy. [c]Behavior changes include cannabis smoking reduction, cannabis smoking cessation, and switching of cannabis formulations.

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Conflict of Interest Statement

The authors have no conflicts of interest to declare.

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Author Contributions

D.S. drafted the manuscript and performed literature search. A.G. conceptualized the piece and edited the manuscript draft. D.S. and A.G. reviewed and approved the manuscript as submitted.

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