CLINICAL VIGNETTE

Cannabinoid Hyperemesis Syndrome vs. Cyclical Vomiting Syndrome

Jason Bahk, MD, FACP and Bryan Lopez, MD

Introduction

Cannabinoid hyperemesis syndrome (CHS) is an entity that has become more commonplace with the recreational legalization of marijuana in the state of California. CHS is managed by recommending immediate cessation of marijuana use and management of withdrawal symptoms with antiemetics, benzodiazepines, and intravenous hydration. Due to hallmark symptoms of incessant vomiting; the underlying pathogenesis of CHS is due to the bioaccumulation of cannabinoids in the adipose tissue. The differential for CHS includes cyclical vomiting syndrome. Hyperemesis syndrome is characterized by idiopathic emesis and vomiting of unclear origin. The aim of this presentation is to provide clinicians with key ways to differentiate the two similar clinical entities.

Case Presentation & Clinical Course

A 25-year-old female was admitted from the emergency department after presenting with three weeks of worsening non-bilious, non-bloody nausea, that improves only with hot showers. This patient's medical history is unremarkable except for mild depression and generalized anxiety disorder that is managed with talk therapy, without any serotonin selective reuptake inhibitors or antidepressant therapy. The patient states that she finds marijuana– both smoked and in the edible form – helps with her anxiety and with insomnia related to her anxiety. She finds sleeping difficult without marijuana use and reports daily marijuana use. Her family history includes mild, well controlled depression, but has no history of any GI issues. The patient does not use any tobacco products and reports minimal alcohol use, usually one to two drinks on the weekends. She acknowledges significant daily marijuana use that the patient reports as "heavy use."

The patient does not use any supplements, over the counter medications, or prescription medications, other than approximately 20 grams of cannabis during this three-week time period. The patient works as an artist with a local film studio and reports no occupational hazards or recent changes in diet.

In the ED, the patient was given IV ondansetron, IV metoproclamide, IV lorazepam with moderate improvement in her emesis and nausea. The reason for admission was oral intolerance of food and liquids and severe dehydration.

On physical examination, she was afebrile with normal BP with mild tachycardia in the low 100s. The patient had decreased turgor pressure, dry oral mucosa and decreased jugular venous distention, tachycardic, with well perfused extremities with 2+ pulses. The rest of her examination was unremarkable. Her laboratories including complete metabolic panel, complete blood count and coagulation panel were also unremarkable except for pre-renal azotemia and acute kidney injury with creatinine elevated to 1.3. EKG showed sinus tachycardia without ischemia. CT angiogram was negative for PE, structural cardiac, pulmonary, and gastroenterological disease.

ER physicians' note differential included cannabinoid hyperemesis syndrome versus cyclical vomiting syndrome. The patient had been previously evaluated by GI for possible CVS and underwent an endoscopy and colonoscopy which were both unremarkable.

The patient's symptom management was continued upon admission. She was given IV lorazepam, IV hydration with normal saline and anti-emetics. A delayed gastric emptying study confirmed the diagnosis of CHS that was suspected after obtaining the patient's marijuana use history.

Discussion

Cyclical vomiting syndrome (CVS) is often confused with and included in the differential diagnosis with cannabinoid hyperemesis syndrome (CHS). Physician admission and progress notes often include "CVS/CHS" as a singular syndrome. Perhaps this is because the treatment for the two conditions is often similar, consisting of intravenous hydration, antiemetics, benzodiazepines, proton pump inhibitors.[1] While the two entities can appear similar, there are a few key differentiators.

CHS is now more common than ever due to the increased availability of commercial cannabis products and anecdotal/non-medical use of medicinal marijuana for generalized anxiety, insomnia, and non-specific nausea and vomiting disorders. Cyclical vomiting syndrome patients also commonly use marijuana as treatment for persistent nausea and recurrent emesis, making the diagnosis even more difficult.

There are two ways to differentiate CHS vs. CVS. The ROME IV criteria established by the American Gastroenterological

Society uses a check list to differentiate between CVS and CHS.[1] Cyclical vomiting syndrome is often characterized by an acute onset of vomiting, non-bilious, non-bloody vomiting that lasts less than 1 week.[1] The diagnostic criteria state that there needs to be three episodes in the previous year, with two episodes in the last 6 months that are at least one week apart.[1] These episodes are episodic in nature and are characterized by periods of time in between episodes that have minimal to no symptoms.[1]

In comparison, cannabinoid hyperemesis syndrome is characterized by similar episodes of emesis that is closely related to sustained excessive (which is not clearly defined) cannabis use, and "relief from vomiting after abstinence from cannabis" with three months of symptoms that must be correlated with initiation or increase in cannabis use 6 months prior to the initiation of symptoms.[1]

Cyclical vomiting is often accompanied by a supportive history of migraines and headaches. Both syndromes are characterized by often co-accompanying mood disorders. There is no clear difference between the two sexes, with a paucity of research regarding this topic.[2]

The key diagnostic study that helps differentiate the difference between CHS and CVS is the gastric emptying study. CHS is characterized by an abnormally slower rate of gastric emptying, CVS is characterized by a hyperdynamic or normal gastric emptying study.[1] The pathophysiology is due to changes in the autonomic system that are beyond the scope of this article. Though the etiology is currently under investigation, there is at least some data regarding a potentially dysfunctional endocannabinoid system.[3] As a result of excessive cannabis use, there is significant underlying endocannabinoid system dysregulation, with increased norepinephrine release, leading to increased sympathetic nervous system firing, HPA axis activation, with increased levels of cortisol axis activation.[1] There also appears to be some association with mood disorders, such as generalized anxiety and depression. The delayed gastric emptying leads to functional obstruction as well, leading to more pro-emetic effects, nausea and vomiting.[2]

Additionally, the diagnosis of CHS can be confirmed with the resolution of symptoms with cannabis cessation, whereas with CVS there is no clear association.

Hot Bathing

Often, patients will report significant pruritus accompanying vomiting that is only relieved with a hot shower. It appears that the temperature associated TRPV1, transient receptor potential vanilloid1 receptions along the nociceptive neuros are activated, thus heat and things like capsaicin help to deactivate the pain signals and the nausea and emesis pathways where TRPV1 is indicated.[1,3]

The relief provided by hot baths and showers by CHS patients has unclear explanation. One of the theories postulates a shift of blood flow to the cutaneous part of the body away from the gastrointestinal tract. This is theoretical, with a paucity of research in this area of interest.[1]

In addition, to the treatments described above, capsaicin cream can be applied to the abdomen to relieve the symptoms of CHS. The most important sequelae of CHS and CVS is acute kidney injury from significant dehydration and poor oral intake of fluids.[1]

Conclusion

The main etiology and cause of cannabinoid hyperemesis syndrome can be delineated from an accurate history, particularly the amount of cannabis consumed. This, along with increased gastrointestinal motility and hypothermia, in addition to the anxiety and depression that often accompanies these symptoms, defines cannabinoid hyperemesis syndrome.

In summary, the three key differentiating characteristics between CVS and CHS are: 1. Rome IV diagnostic criteria, a check list devised to differentiate the two similar but distinct syndromes, 2. A clear resolution of hyperemesis symptoms with marijuana cessation, 3. Delayed as opposed to normal or increased gastric transit time during a gastric emptying study.

REFERENCES

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