From Heave to Leave: Understanding Cyclic Vomiting Syndrome (CVS) and Cannabionoid Hyperemesis Syndrome (CHS) in the Adult Population

Andrea H. Thurler, DNP, FNP-BC
Presentation Objectives

- Introduction
- Defining Cyclic Vomiting Syndrome
- Defining Cannabinoid Hyperemesis Syndrome
- Epidemiology
- Approach to Patient Care
  - Outpatient Considerations
  - Inpatient Considerations
- Research
- Conclusions/ Questions
Introduction: Cyclic Vomiting Syndrome (CVS)

- Chronic functional GI disorder characterized by stereotypical episodes of nausea and vomiting with periods of wellness in-between.

- Dr. Samuel Gee first described CVS in 1882 in the pediatric population.

- Considered to be a variant of migraines.

Bhandari, 2017
Introduction: Cannabinoid Hyperemesis Syndrome

- Marijuana is the most commonly used drug in the U.S.
- First described in 2004
- Usually starts years after chronic marijuana use
- Cyclic episodes of nausea and vomiting
- Excessive hot showers/baths
- Avoid opioid use

Aziz, 2019
Epidemiology

• The **incidence** (rate of occurrence of newly diagnosed cases) and **prevalence** (percent in a given population with known diagnosis) of cyclic vomiting syndrome in adults is unknown

• Prevalence in an outpatient GI clinic was 11%

• only 5% of these patients were diagnosed accurately by their referring provider despite meeting the criteria for a CVS diagnosis

Sagar, 2018
Epidemiology

• Affects both males and females however difficult to get a consensus

• Recent study shows 74% of adults with CVS are female

• Recent nationwide analysis:
  • 63% White
  • 18% African American
  • 6% Hispanic
Approach to Patient Care: Outpatient and Inpatient
Case Presentation

• 18 year old male with episodes of nausea and vomiting

• Started 7 months ago when he started college

• Episodes start with abdominal fullness, nausea and diarrhea and progress into vomiting

• Episodes last 2-7 days, worsen with larger meals and high fat foods
Case Presentation

- He feels well in-between these episodes however they seem to occur almost monthly at this point.
- Resulted in 4 emergency room trips over the past 7 mos:
  - Two trips required inpatient admission.
- Given medicines upon arrival:
  - IV morphine and benadryl.
Case Presentation

Current Medications:

- multivitamin,
- Sertraline (Zoloft)
Case Presentation

• Social:
  – Tobacco: none
  – Drinks 2-3 hard alcoholic beverages on the weekends
  – occasional marijuana use, started smoking 2 months ago at a party, helps when he has nausea symptoms
Case Presentation

- Freshman in college, studying psychology
- Hoping to get an internship at school next year
Case Presentation

- Objective Testing:
  - Abdominal CT scan: normal exam
  - Upper Endoscopy: normal exam
  - Gastric Emptying Scan: 99% of the meal emptied in 4 hours
  - Upper GI Series with Small Bowel Follow through: normal small bowel motility, no structural defects
Defining CVS: Rome IV Criteria

- Rome IV criteria for the diagnosis of cyclic vomiting syndrome in adults
- Criteria must be fulfilled for last 3 months, with onset at least 6 months prior to diagnosis

1. Stereotypical episodes of vomiting regarding onset (acute) and duration (less than 1 week). Episodes abrupt in onset and occurring at least 1 week apart

2. Three or more discrete episodes in the prior year
   Two episodes in the past 6 months with absence of vomiting between episodes. Other milder symptoms can be present between episodes.

3. Personal and/or family history of migraines are supportive criteria
Defining CHS: Rome IV Criteria

- Rome IV criteria for the diagnosis of cannabinoid hyperemesis syndrome in adults

- Criteria must be fulfilled for last 3 months

1. Stereotypical episodes of vomiting regarding onset (acute) and duration (less than 1 week). Episodes abrupt in onset and occurring at least 1 week apart

2. Prolonged cannabis use

3. Relief with cessation of cannabis use.
   - Benefit with hot showers are not a required criteria but may be clinically significant
# Chronic Nausea and Vomiting Syndrome vs. Cyclic Vomiting Syndrome

<table>
<thead>
<tr>
<th>Table 1. Rome IV Criteria for Functional Nausea and Vomiting Disorders[^2]</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CNVS</strong></td>
</tr>
<tr>
<td>---------------------------------------------------------------</td>
</tr>
<tr>
<td>Must include all of the following:</td>
</tr>
<tr>
<td>1) Bothersome nausea occurring at least 1 day per week and/or ≥1 vomiting episodes per week</td>
</tr>
<tr>
<td>2) Self-induced vomiting, eating disorders, regurgitation, or rumination are excluded</td>
</tr>
<tr>
<td>3) No evidence of organic, systemic, or metabolic diseases that is likely to explain the symptoms on routine investigations (including at upper endoscopy)</td>
</tr>
<tr>
<td>4) The symptoms have to be present for the past 3 months with onset at least 6 months prior</td>
</tr>
</tbody>
</table>

[^2]: CNVS, chronic nausea and vomiting syndrome; CVS, cyclic vomiting syndrome.

[^a]: Cannabinoid hyperemesis syndrome is a variant of CVS, in which the symptoms are attributed to chronic cannabis use and resolve after stopping cannabis.
Chronic Nausea and Vomiting Syndrome vs. Cyclic Vomiting Syndrome

Aziz et al, 2019

Figure 2. The association between functional vomiting subtypes, cannabis use, and the need for hot water baths to alleviate emetic symptoms. P values denote chi-square test results for trend.
Differential Diagnosis

- Cannabinoid Hyperemesis Syndrome
- Peptic Ulcer Disease
- Gastroparesis
- Biliary tract dysmotility
- Urea cycle defects
- Renal colic
- Adrenal insufficiency
- Central nervous system disorder
- Intermittent small bowel obstruction
Cyclic Vomiting Syndrome

It is very important to take a careful history:

- How often does vomiting occur?
- Is there a complete resolution of symptoms between episodes?
- Was there an incipient event?

Thurler, A.H. and Kuo, B., 2013
Cyclic Vomiting Syndrome

- Examine GI studies including but not limited to:
  - Gastric Emptying Scan
  - Upper Endoscopy and Colonoscopy
  - CT scan
  - Small bowel follow through
  - Magnetic Resonance Enterography

- What medications are the patient taking?

Thurler, A.H. and Kuo, B., 2013
Cyclic Vomiting Syndrome
Treatment Options
CVS Phase Treatment Option(s)

Interepisodic → Prodromal → Vomiting → Recovery → Interepisodic

Thurler, A.H. and Kuo, B., 2013
Outpatient Considerations

• Appropriate Diagnosis
• Regular follow up every six months
• Medication reconciliation
• Establish an acute care plan (incase inpatient/ ED visit are required)
  – this is key to initiate abortive therapies upon arrival to hospital
  – i.e. IV hydration, IV Ativan and IV Zofran
Outpatient Considerations

- Sleep hygiene
- Good nutrition
  - i.e. avoiding triggering foods
- Stress management
- Avoiding triggers
  - i.e. stress, alcohol, marijuana
- Strong support system
First Line: Tricyclic Anti-depressants (TCA)

- Not to treat depression
- The doses used are low and usually given at night due to sedative effects
- Serve as a daily medicine to decrease the frequency and severity of attacks
- Help stabilize neurotransmitters
  - Control of “fight or flight”

Examples:
- Amitriptyline
- Nortriptyline
- Desipramine
- Imipramine
Interepisodic (cont)

Second Line options: (if TCAs fail)

- SSRI: Citalopram
  - increases and maintains the amount of serotonin in the brain

- Beta Blocker: Propranolol
  - Can reduce anxiety
  - Can decrease heart rate

- Antihistamine: Cyproheptadine
  - Serves as a sedative and anti-nausea

Thurler, A.H. and Kuo, B., 2013
Interepisodic (cont)

Anticonvulsants:
- Help stabilize nerve membranes
  - Phenobarbital
  - Valproate
  - Carbamazepine
  - Gabapentin
  - Topiramate
  - levetiracetam
  - zonisamid

Other options:
- Supplements: L-Carnitine, Coenzyme Q-10
  - Benefits have been seen in pediatric and adult patients with migraines
  - Helps with cell function

Thurler, A.H. and Kuo, B., 2013
Prodromal & Vomiting Acute (abortive)

**Anti-emetics**
- Reduce nausea and vomiting
  - Ondansetron
  - Granisetron

**Benzodiazepines**
- Break the cycle, help the patient with a deep sleep
  - Lorazepam
  - Chlorpromazine
  - Dophenydramine

**Anti-psychotic**
- Decreases benzodiazepine dependence, decreases anxiety
  - haldol

Thurler, A.H. and Kuo, B., 2013
Prodromal & Vomiting Acute (abortive)

Anti-Migraine

- Sumitriptan
- Frovatriptan
- Rizatriptan
- Zolmitiptan

- **AVOID opioids** despite significant pain
CVS Phase Treatment Option(s)

Thurler, A.H. and Kuo, B., 2013
Inpatient Considerations

• Considerations when coming to the hospital
• IV fluids to be administered as soon as possible
  • IV benzodiazepine
  • IV anti-emetic
  • Topical lotions such as capsaicin
  • Access to a hot shower
• Quiet, dark, private room preferred
Inpatient Considerations

- Primary team to rule out causes of nausea and vomiting
  - Consider diagnosis of CVS or CHS
- Inform the inpatient team that you have a known diagnosis of CVS
  - Previously established acute care plan
- Communication with the outpatient team.
CVS Phase Treatment Option(s)

Thurler, A.H. and Kuo, B., 2013
Recovery Phase

- Allow patient to recover without relapse of nausea and vomiting
- Slowly advance the diet:
  - Nothing by mouth → clear liquid → liquid → soft → solid
Patient Resources

• Cyclic vomiting syndrome association
  – http://cvsaonline.org

• National Institute of Diabetes and Digestive and Kidney Diseases
Cyclic Vomiting Syndrome (CVS) and Episodic Migraine have been suggested to share pathophysiology, but no studies have yet compared these conditions.

CVS, compared to migraine and healthy controls, displayed increased connectivity between the salience brain network and the mid/posterior insula, a brain region important for viscero sensory processing. Both CVS and migraine displayed diminished insular connectivity with the sensorimotor network.

We identify both CVS-unique and potentially shared pathophysiology between CVS and episodic migraine, highlighting the middle/posterior insula as a potential target for therapeutics in future studies.
Ongoing CVS Research

- CVS registry: Identifying and tracking patients with CVS to understand natural history of disease
- Genetics and microbiome of CVS
- Brain Imaging in CVS: Is it unique?
- Abnormal hormone and autonomic nervous system difference in CVS
- What is the impact of Marijuana in the brain of CVS
Team Recognition

- Braden Kuo, MD
- Kyle Staller, MD
- Stephanie Doherty, NP
- Kristina Skarbinski, NP
- Beth Friedlander, NP
- Maria Grifone, RN
- Chris Velez, MD
- Janet Pittman

Research coordinators:
- Casey Silvernale
- April Mendez
- Abbey Bailey
- Mariana Almeida
References


Thank You

Questions?