A Unique Case of Bulimia-Induced Purging Immediately Followed by Cannabis-Induced Hyperemesis: Is There a Co-Relation?

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Cannabis is the most prevalently used illicit substance in the United States and globally, with the highest prevalence in the 18- to 25-year-old age group.[1] As legislation on cannabis use transforms within the United States to increase ease of access, physicians must be aware of medical manifestations that arise from acute and chronic use of cannabis. Often these signs are underrecognized, leading to invasive and expensive diagnostic testing.[1–3] Long-term cannabis use is associated with cannabinoid hyperemesis syndrome (CHS) characterized by cyclical vomiting episodes, nausea, colicky abdominal pain, and compulsive use of hot showers to relieve symptoms.[1,4] Here, we present a unique presentation of an adolescent girl with a history of bulimia nervosa with multiple chronic episodes of voluntary purging, which were immediately followed by CHS.

There is a significant prevalence of eating disorders in individuals who present with substance use disorders (50% vs 9% in the general population).[4] The prevalence of any substance use was 48.7% in patients with bulimia nervosa according to 1 study.[5] Urges to consume food leverage similar dopaminergic and opiate pathways, highlighting the overlap between substance use disorders and eating disorders.[6] Symptomatic similarities include substantial time engaging in the activity (binge eating or substance use), inability to decrease activity despite the effort, substantial time devoted to the activity and the continuation of the activity despite its negative impact, and triggers often serving as a means to regulate negative affect.[6]

Case Report

Here, we present a case of a 17-year-old Hispanic girl with a past psychiatric diagnosis of bulimia nervosa, cannabis use disorder, and general anxiety disorder. She presented to the psychiatric inpatient unit with worsening anxiety, depression, and suicidal thoughts secondary to intractable nausea and cyclical vomiting. The episodes started with bingeing and voluntary purging for a desire to lose weight, which was suggestive of bulimia nervosa, at around age 12 years. She stopped purging voluntarily at around age 13 1/2 years after losing close to 80 lb, going from 220 lb to 140 lb and reaching her desired weight goal. However, approximately 6 months after that, she started having episodes of vomiting that were involuntary and intractable. She complained of severe abdominal pain and intractable nausea/vomiting over a few months. She had numerous emergency department visits. She was admitted to hospital medical floors multiple times between the ages of 14–16 years. However, an exhaustive medical workup including comprehensive blood investigations, immunology panel, computed tomography (CT) brain scan, CT abdomen scan, biopsies testing for *H pylori*, and transvaginal ultrasound to evaluate for a possibility of Fitz-Hugh-Curtis syndrome were unremarkable. She received a diagnosis of CHS during her medical hospitalization.

The patient received several doses of ondansetron and topical capsaicin, with minimal to no effect on her nausea and vomiting. She noted improvement in her nausea and vomiting only with hot showers and reported taking 3–6 hot showers a day until recently. On further exploration, she did report that she started smoking cannabis at age 13 ½, culminating in heavy daily use by age 14, with a 6-month gap between cessation of self-induced vomiting and the intractable hyperemesis episodes. Her episodes of cyclical nausea and vomiting would improve minimally when she was in the inpatient unit, during which time she was abstinent from cannabis. During the current hospitalization, the patient was continued on mirtazapine 15 mg at bedtime, which helped her with sleep and appetite. She was also started on amitriptyline, which was titrated to 37.5 mg at bedtime to help with diffuse abdominal pain in the context of cyclical vomiting. The patient reported improvement in nausea and the diffuse abdominal pain and was discharged to outpatient psychiatry and addiction follow-ups after a 2-week inpatient stay. Her symptoms were peculiar in that they started with binge eating and purging behavior and

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self-induced vomiting with the intention to lose weight but later developed into symptoms consistent with CHS.

Discussion

To our knowledge, this is the first reported case of bulimia nervosa with compensatory purging that was immediately followed by the diagnosis of CHS. Previous studies have shown that the vast majority of patients were using cannabis (68%) for an average of 2 years before they developed CHS.[1] In our case, the duration was less than 6 months.

There is some evidence regarding common pathways that can lead to bulimia nervosa as well as cannabis use disorder. Bulimia nervosa and cannabis use disorder have both been associated with reduced prefrontal cortex activity, which has been associated with self-control and maladaptive dopaminergic and opioid pathways.[4] Additionally, polymorphisms have been found in the μ-opioid receptor gene and dopamine receptor D2 genes in patients with cannabis use disorder and bulimia nervosa, thus potentially increasing susceptibility to reward responses to food and substances.[5,6] Moreover, cannabis abuse and binge eating can serve as a modulator of stress and emotional states.[7]

Patients with bulimia nervosa have a higher gastric capacity, delayed gastric emptying, and impaired gastric relaxation compared to patients without bulimia nervosa. They also have delayed cholecystokinin response, which leads to decreased postprandial satiety. There is also some evidence of vagal nerve dysfunction, higher pain sensitivity, and decreased leptin levels.[8] There is evidence of serotonin dysfunction that is related to being more impulsive and novelty seeking. Higher rates of stress reactivity and perfectionism have also been found in these patients.[8] In addition, bulimia nervosa leads to abnormal HPA axis feedback, which in turn leads to an abnormal sympathetic stress response, which has been implicated in the development of CHS, which is why parenteral benzodiazepines have evidence in treatment.[9,10] All these factors could potentially contribute to increased susceptibility to CHS.[9,10]

In our case, we found no history of cannabis use during the time the patient had voluntary purging behavior. The cannabis use started less than 6 months before CHS was diagnosed. We hypothesize that bulimia nervosa–related purging might make the patient more prone to develop CHS much quicker than expected after starting cannabis use. These findings need to be explored as a risk factor with large-scale studies to further our understanding of the pathophysiology of CHS and its relationship to bulimia nervosa.

Clinicians also need to be mindful of less frequent but longer-lasting side effects that can occur in teenagers using substances of abuse, which can lead to longer-lasting physical or neuropsychological sequelae.[11] Being cognizant of comorbidities, both psychiatric and substance abuse related, that occur with eating disorders in teenagers is of the utmost importance.

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