Cannabinoid Hyperemesis Syndrome Masquerading as Uremia: An Educational Case Report

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Abstract
Rationale: With marijuana legalization, clinicians need to be aware of Cannabinoid Hyperemesis Syndrome (CHS), which may masquerade as other disease states such as uremia.
Presenting concerns of the patient: A 37-year-old man with bipolar affective disease treated with lithium had progressive renal insufficiency presumably on the basis of interstitial fibrosis. He developed persistent and severe nausea and vomiting which was assumed to be on the basis of uremia. Predating the nausea and vomiting was a history of daily marijuana use.
Diagnoses: Renal insufficiency, bipolar affective disease, and intractable nausea and vomiting.
Interventions: Dialysis was initiated but did not improve his symptoms and multiple investigations revealed no other cause. Abstinence from marijuana use resulted in complete resolution of symptoms.
Outcomes: The patient elected to discontinue dialysis and was still alive 7 months later. We concluded the nausea and vomiting were not on a uremic basis but more likely due to CHS.
Lessons learned: With more widespread use of marijuana, it is important to be aware of CHS, which may be confused with uremia in patients with concomitant renal insufficiency.

Keywords
uremia, renal insufficiency, cannabinoid hyperemesis syndrome, marijuana

Received February 1, 2018. Accepted for publication May 28, 2018.
What was known before

There is one abstract in the literature of a case of Cannabinoid Hyperemesis Syndrome (CHS) masquerading as uremia in a patient with 2 conditions: end-stage renal failure and CHS. Discontinuation of marijuana resulted in resolution of symptoms of nausea in this patient who required ongoing dialysis.

What this adds

Knowledge of CHS as an entity completely changed the approach to our patient’s symptoms, which were mistakenly attributed to uremia. Appropriate diagnosis and management allowed discontinuation of dialysis.

Introduction

Timing of initiation of dialysis can be difficult for the nephrologist and is based on both biochemical markers and symptoms of uremia. Studies of early versus late dialysis start showed no benefit to early start or possible detrimental effects.1,2 Symptoms of the uremic state may be confused with those of other conditions which may lead to not only inappropriately early initiation of dialysis but also failure to correctly identify an underlying disease. We present a case which assumed uremia as the sole cause for symptoms when, in fact, cannabinoid hyperemesis syndrome (CHS) was the correct diagnosis. The patient has provided informed consent.

Case Report

A 37-year-old male with a history of bipolar affective disease treated with lithium developed progressive renal insufficiency presumably on the basis of interstitial fibrosis. Past history was also positive for hypertension and hyperthyroidism requiring thyroidectomy.

This patient began to use cannabis in 2004 for self-management of tremors, restless leg syndrome, and to calm his irritability and anxiety. In 2014, he began to access the product from an authorized producer under the Canadian medical marijuana access regulations.

In 2011, he developed nausea and vomiting unassociated with abdominal pain, melena, or hematochezia. Although no other signs or symptoms of uremia were present, the presumption was, given a serum creatinine of 466 µmol/L and an estimated glomerular filtration rate (eGFR) of 10 mL/min by Chronic Kidney Disease Epidemiology Collaboration (CKD-EPI) and Modification of Diet in Renal Disease (MDRD) equations, the vomiting was on the basis of uremia. Peritoneal dialysis (PD) was commenced September 2013. Despite PD, the vomiting persisted and although excellent clearance was achieved (mean weekly Kt/v: 3.11 and creatinine clearance: 124 L), it was assumed that PD provided inadequate dialysis. Two years later, he was transitioned to hemodialysis (HD) thrice weekly. Again, there was no improvement in symptoms despite an average single-pool Kt/v > 1.68. Investigations including multiple upper and lower gastrointestinal endoscopies, gastric emptying studies, brain computed tomography (CT) and magnetic resonance imaging (MRI), and neurological evaluation yielded no abnormalities. He required a percutaneously inserted central catheter for home administration of intravenous dimenhydrinate and ondansetron 4 to 6 times daily to offset his symptoms. These antiemetics were incompletely effective. The patient’s health continued to fail with reduction in weight from 77.6 kg in August 2013 to 50.5 kg in November 2016 and he required enteral supplementation.

In 2016, the patient and his psychiatrist simultaneously entertained a possible diagnosis of CHS.3 He was admitted to psychiatry for discontinuation of marijuana. During his 3-week inpatient stay, the nausea settled, appetite improved, and his weight increased by 5 kg. At discharge, urine toxicology screen was negative for the marijuana metabolite tetrahydrocannabinol (THC).

In consultation with his psychiatrist, nephrologist, and his family, the patient elected to discontinue dialysis in 2017. Seven months later, despite an eGFR of 7 mL/min, the patient felt well without uremic symptomatology and no longer

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Table 1. Proposed Clinical Diagnostic Criteria for Cannabinoid Hyperemesis Syndrome.3

| Essential for diagnosis | Long-term cannabis use: more than 1 year |
|-------------------------|-------------------------------------------|
| Major features          | Severe cyclic nausea and vomiting         |
|                         | Resolution with cannabis cessation        |
|                         | Relief of symptoms with hot showers or baths |
|                         | Epigastric or periumbilical abdominal pain |
| Weekly use              |                                          |
| Supportive features     | Age younger than 50 years                 |
|                         | Weight loss over 5 kg                     |
|                         | Morning predominance of symptoms          |
|                         | Normal bowel habits                       |
|                         | Negative laboratory, radiographic, and endoscopic test results |

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required ondansetron. He continues to abstain from marijuana.

Discussion
Marijuana is the most widely used illicit drug in North America both medically and recreationally and its use has increased where decriminalized or legalized. Among its many touted medical benefits, marijuana may increase appetite and relieve nausea. Nausea, particularly for chemotherapy-induced nausea and vomiting, was an early focus of cannabis research beginning in the 1970s leading to THC-based oral medications in the 1980s indicated solely for this purpose.

However, paradoxically, chronic cannabis use has been implicated as the cause of cyclical nausea and vomiting often associated with colicky abdominal pain. These are presenting symptoms of CHS, first described in 2004 by Allen et al. Other features supporting a diagnosis of CHS (Table 1) include male gender, long-term cannabis use (>1 year), age less than 50 years, weight loss >5 kg with normal bowel habits, negative investigations, and improvement in symptoms with drug cessation.3,5

Interestingly, many cannabis users are more aware than medical practitioners of this paradoxical hyperemesis. They often self-learn that compulsive hot baths or showers temporarily relieve symptoms, assisting a clinician in diagnosis. Although our patient had not adopted the routine of hot bathing to relieve nausea, nor did he have abdominal pain, we felt he met the criteria for a diagnosis of CHS. Going against a diagnosis of uremia is his long survival without dialysis.

There are several case reports of acute kidney injury in association with CHS 6-8 likely on the basis of prerenal failure due to volume depletion. In our patient, the pattern of persistently elevated serum creatinine over time and the absence of clinical findings of extracellular volume contraction were in keeping with chronic renal insufficiency.

One other case of CHS masquerading as uremia in a chronic renal failure patient has been reported in the literature.9 This patient on dialysis had also undergone multiple medical investigations and adjustment of dialysis modality. What was deemed to have been uremia was in fact CHS, and with discontinuation of marijuana, the nausea and vomiting resolved in this patient who remained dialysis dependent. Our patient with CHS differed in that he never required dialysis. So, CHS may be mistaken for uremia, as in these 2 patients with chronic kidney disease, hyperemesis gravis, bulimia, and cyclical vomiting syndrome. Unfortunately, in our patient, there was a 5-year delay in correctly diagnosing CHS due to unfamiliarity with this entity and associated chronic renal disease confounding the presentation. This was costly to our patient physically, emotionally, and financially, and subjected him to unnecessary dialysis and investigations.

Although cannabinoids may offer potential medical benefits, many clinicians are unaware of the adverse effect profile associated with use. With legalization of marijuana and expected increased usage, it will be incumbent upon nephrologists to familiarize themselves with these adverse effects, particularly CHS which may masquerade as uremia.

Ethics Approval and Consent to Participate
Ethical Approval is required for this case study. Consent to participate was obtained from the patient.

Consent for Publication
The co-authors agreed to the publication.

Availability of Data and Materials
The location of the research materials is St. Paul’s Hospital Saskatoon, Saskatchewan, Canada.

Declaration of Conflicting Interests
The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding
The author(s) received no financial support for the research, authorship, and/or publication of this article.

References
1. Cooper BA, Branley P, Bulpone L, et al. A randomized, controlled trial of early versus late initiation of dialysis. N Engl J Med. 2010;363:609-619.
2. Rivara MB, Mehrotra R. Is early initiation of dialysis harmful? Semin Dial. 2014;27(3):250-252.
3. Simonetto DA, Oxentenko AS, Herman ML, Szostek JH. Cannabinoid hyperemesis: a case series of 98 patients. Mayo Clin Proc. 2012;87:114-119.
4. Allen JH, de Moore GM, Heddle R, Twartz JC. Cannabinoid hyperemesis: cyclical hyperemesis in association with chronic cannabis abuse. Gut. 2004;53:1566-1570.
5. Sorensen CJ, DeSanto K, Borgelt L, Phillips KT, Monte AA. Cannabinoid hyperemesis syndrome: diagnosis, pathophysiology, and treatment-a systematic review. J Med Toxicol. 2017;13(1):71-87.
6. Abodunde OA, Nakda J, Nweke N, Veera RL. Cannabinoid hyperemesis syndrome presenting with recurrent acute renal failure. J Med Cases. 2012;4(3):173-175.
7. Habboushe J. Cannabinoid hyperemesis acute renal failure: a common sequela of cannabinoid hyperemesis syndrome. Am J Emerg Med. 2014;32(6):690.e1-690.e2.
8. Srihari P, Liu M, Punzell S, Shebak SS, Rea WS. Cannabinoid hyperemesis syndrome associated with compulsive showering and acute kidney injury. Prim Care Companion CNS Disord. 2016;18(1).
9. Qipo A, DeLorme J, Anis K, Acharya A. Cannabinoid hyperemesis syndrome (CHS) versus uremia in a patient with end stage renal disease. Am J Kidney Dis. 2014;63(5):B92.