DIAGNOSING AND TREATING CANNABINOID HYPEREMESIS

Olivia Wilson and colleagues explain a syndrome caused by regular cannabis use that involves vomiting but does not respond to antiemetics

Abstract

Cannabinoid hyperemesis is a newly emerging syndrome that manifests as intractable nausea and vomiting in people who regularly smoke cannabis. The signs and symptoms are relieved by bathing in hot water and by stopping smoking cannabis but are unresponsive to antiemetics. This article briefly examines the possible causes and clinical presentation of the condition and uses a case study to describe the management of patients.

Keywords
antiemetics, cannabinoid hyperemesis, cannabis, emergency care, marijuana smoking, nausea

In recent years, a syndrome called cannabinoid hyperemesis, characterised by vomiting and nausea that are relieved by stopping smoking (Sontineni et al 2009) or bathing or showering in hot water, has emerged in clinical practice. The syndrome was first reported by Allen et al (2004) and since then has been described by a number of other authors (Boeckxstaens 2005, Chang and Windish 2009, Wild and Wilson 2012).

Some researchers suggest that patients who present with cannabinoid hyperemesis syndrome will have smoked cannabis regularly for several years. For example, Soriano-Co et al (2010) found that patients with the syndrome had used cannabis for up to 16 years. However, Budhraja et al (2008) found that patients had used it regularly for only one year, while a retrospective examination of 98 patients found that 32% reported using cannabis for less than a year (Simonetto et al 2012).

Cannabis is traditionally associated with antiemetic effects and used in patients with cancer and other conditions to relieve nausea and vomiting (Ishaq et al 2014). Chronic cannabis use can result in an accumulation of the drug leading to delayed gastric emptying, known as gastric stasis, which counteracts the antiemetic effect (McCallum et al 1999, Pertwee 2001, Allen et al 2004).

The antiemetic effect of cannabis is due to the action on cannabinoid type 1 receptors in the brain of delta-9 tetrahydrocannabinol (THC), the active ingredient in cannabis (Pertwee 2001, Sontineni et al 2009). THC is metabolised by cytochrome P450 (Watanabe et al 1995) in the
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liver (Grotenhermen 2003) and the resulting acid metabolites are excreted in urine and faeces. THC also acts on the central and enteric nervous system through cannabinoid type 1 and 2 receptors (Warner et al 2014), which delays gastric motility, leading to the nausea and vomiting typical of the syndrome.

### Managing cannabinoid hyperemesis

**Signs and symptoms** Cannabinoid hyperemesis syndrome is an emerging clinical diagnosis in emergency medicine, possibly because of the increase in the availability and potency of cannabis. Allen et al (2004) have published 19 case studies on the topic and other authors have since described similar signs and symptoms (Boeckxstaens 2005, Chang and Windish 2009, Sontineni et al 2009).

Allen et al (2004) demonstrate that patients with cannabinoid hyperemesis can display various signs and symptoms, including sweating, thirst, colicky abdominal pain and alteration in core body temperature, which could be caused by modulation of the hypothalamic-pituitary-adrenal axis by endocannabinoids (Howlett et al 2002, Allen et al 2004). In the absence of other possible diagnoses, such as pancreatitis, diabetic ketoacidosis or cholecystitis, cannabinoid hyperemesis should be considered in patients with cyclical vomiting.

A case study involving a woman with cannabinoid hyperemesis syndrome is shown below. The woman concerned had some relief from the nausea and vomiting by bathing in hot water, but the reason for this is unknown (Warner et al 2014). Some authors suggest it is due to the deregulation of the thermoregulatory system of the hypothalamus (McCallum et al 1999).

### Case study

Mary, a 32-year-old woman, presented to an emergency department (ED) with a five-day history of vomiting, nausea and abdominal pain.

Although previously healthy, this was Mary’s second attendance in five days. She had been discharged after her first visit with an antiemetic, which had not resolved the sickness. Mary had not had these signs and symptoms before and said that over the previous five days she had been vomiting about four times an hour. Analgesics and antiemetics had not relieved the sickness or pain, but a hot water bottle resting on her abdomen had eased the nausea for a short time and bathing relieved it for longer.

Mary had no significant medical history and no allergies and did not drink or smoke tobacco, but further questioning revealed that she smoked ‘grass’ up to three times a day and more frequently at weekends and had done so for seven years.

Mary’s vital signs were all within normal range: temperature 36.2°C; blood pressure 136/80; pulse 72 beats per minute; respiratory rate 17 breaths per minute; blood sugar 5.4mmol/L and 99% oxygen saturation on room air. She appeared irritable and continued to vomit, but her early warning score was zero, her pupils were equal and reactive to light and extraocular movement was normal.

There was no lymphadenopathy, and cardiovascular, respiratory and abdominal examinations were unremarkable apart from mild epigastric tenderness.

All blood tests were normal and a urine dipstick was positive for ketones. Urine drug screening was not performed and a pregnancy test was negative. All differential diagnoses including gastroenteritis, and neurological, genealogical and abdominal pathology were excluded.

Mary was given 1L of intravenous (IV) saline and IV ondansetron hydrochloride, which is an antiemetic, but she refused pain relief as vomiting was her main complaint.

She was diagnosed with cannabinoid hyperemesis based on her cannabis use and the fact that her signs and symptoms were relieved by bathing. She was discharged home with a five-day course of antiemetics and was advised to stop using cannabis.

A telephone follow up four weeks after discharge revealed that Mary’s symptoms had resolved when she stopped smoking cannabis. A second telephone follow up at 12 weeks revealed that Mary’s symptoms had returned when she started to use the drug again, but resolved when she stopped. She was then offered drug addiction counselling, which she declined.
Clinical presentation Clinical presentation can be divided into three stages: the prodromal phase, the vomiting phase and the recovery phase (Soriano-Co et al 2010).

- **Prodromal phase:** manifests as nausea, fear of vomiting and abdominal pain. Price et al (2011) note that symptoms are most common in middle-aged adults who have been using cannabis since their teenage years.
- **Vomiting phase:** this is characterised by persistent nausea and vomiting, which can occur up to five times an hour alongside epigastric and abdominal discomfort. These signs and symptoms can be relieved by bathing in hot water. Patients often attend emergency departments at this stage for symptom relief. Investigations tend to be unrewarding.
- **Recovery phase:** vomiting is relieved when people stop smoking cannabis and signs and symptoms decrease then stop within a week of cessation. Symptoms can reoccur if people start smoking cannabis again.

Treatment Patients with cannabinoid hyperemesis syndrome are treated with IV fluids and supportive care. Some researchers report a high frequency of gastritis and oesophagitis in patients with the condition and recommend administering a proton pump inhibitor such as IV pantoprazole 40mg (Chang and Windish 2009, Patterson et al 2010).

Conclusion Cannabinoid hyperemesis syndrome is a relatively new presentation. The adverse effects of long-term cannabis use are still under investigation, and the mechanism behind intractable vomiting is still unclear (Soriano-Co et al 2010). However, the widespread use of cannabis for recreational and medical purposes means it is essential that ED clinicians are aware of this syndrome and should consider it when patients’ vomiting and nausea are unresponsive to antiemetics but can be relieved by hot bathing or showering. This could prevent unnecessary investigations and inappropriate admissions.

There is a lack of high-quality research on cannabinoid hyperemesis syndrome as most of the literature is based on case studies. However the description of the condition is consistent in various articles (Price et al 2011, Wild and Wilson 2012, Ishaq et al 2014, Warner et al 2014). The lack of data could be because the condition tends to be unrecognized in emergency departments. This article aims to raise awareness of the syndrome and highlight the importance of obtaining accurate and thorough patient histories.

References