Articles You Might Have Missed

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de Bakker JK, Nanayakkara PW, Geeraedts LM Jr, de Lange ES, Mackintosh MO, Bonjer HJ. **Body Packers: a Plea for Conservative Treatment.** *Langenbecks Arch Surg.* 2012 Jan; 397(1):125-30. Epub 2011 Oct 8.

Background: Smuggling of drugs via internal concealment, known as “body packing,” is on the rise. Early methods of internal concealment relied on swallowed drug packets constructed from available materials such as balloons and condoms. Packet rupture was associated with high mortality. Modern drug packets are machine produced and carry a lower risk of rupture. Body packers may present with non-life-threatening symptoms such as nausea or bowel obstruction. The optimal approach to management of these patients is not known.

Research Question: This study aims to evaluate the efficacy of a protocol for diagnosis and treatment of body packers, including determining the need for surgical intervention.

Methods: A retrospective chart review was performed over a 6-year period. Patients were identified by a recorded diagnosis of “body packer.” All patients included in the study were treated according to a protocol including vital sign monitoring, laboratory testing, and radiographs. If plain abdominal X-rays were inconclusive, a CT scan of the

abdomen was performed. The study center's protocol mandated surgical removal of drug packets for signs of drug intoxication, ileus, or persistence of drug packets in the stomach for >48 h. Surgically treated patients were compared to conservatively managed patients.

Results: Cocaine was the most commonly found drug in both surgically ($n=64$) and conservatively managed ($n=79$) patients. There was no significant difference in the number of packets ingested between groups. Surgically managed patients had higher prevalence of abdominal pain (53 vs. 31 %) and vomiting (20 vs. 13 %) at presentation. Sixteen percent of surgical patients developed a wound infection, 16 % had a fascial dehiscence, and 8 % had both. Wound infection was associated with a longer length of hospitalization. Mean hospital length of stay was significantly prolonged in surgically managed patients (7 vs. 2 days). Comparing asymptomatic patients who underwent surgery for packets remaining in the stomach >48 h to those with drug packets in the stomach for <48 h, there were no significant differences in mortality, ICU admission time, and hospital admission time. No significant differences in rates of wound infection, fascial dehiscence, re-laparotomy, or anastomotic leakage were found between surgically managed patients with drug packets in the stomach for >48 vs. <48 h.

Conclusion: Asymptomatic body packers can be managed conservatively, even if drug packets remain in the stomach for >48 h. Surgical treatment should be reserved for those patients with ileus or signs of drug intoxication.

Critique: This study is limited by its retrospective nature. As a single-center study, the results may not be generalizable to different patient populations. The cutoff time of 48 h to determine surgery was chosen arbitrarily. Optimal timing of surgical intervention in asymptomatic patients is still not certain. The ideal surgical approach to packet retrieval is unknown and the surgical method in this study was not standardized. The authors note that wound complications occurred at higher frequency than expected for laparotomy when compared to several references. Alternative

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methods of drug removal, such as endoscopy, were not compared.

Implication for Toxicologists: This study suggests that asymptomatic body packers with drug packets in the stomach > 48 h should be managed conservatively without surgery. Further study is warranted to characterize the ideal timing of surgical intervention, if any, in asymptomatic patients.

Aaron B. Skolnik and Anne-Michelle Ruha

Simonetto DA, Oxentenko AS, Herman ML, Szostek JH. Cannabinoid Hyperemesis: a Case Series of 98 Patients. Mayo Clin Proc. 2012 Feb;87(2):114-9.

Background: Cannabis is widely used in the USA and worldwide. In recent years, a syndrome of cannabinoid hyperemesis (CH) has been described. Clinical features of CH include cyclic vomiting, colicky abdominal pain, and compulsive use of hot showers for symptomatic self-treatment. These features must occur in the setting of long-term cannabis use and improve with cannabis cessation. It is likely that this disease is frequently missed, given the high international prevalence of cannabis use.

Research Question: To describe, in the largest case series to date, the clinical features of 98 patients with cannabinoid hyperemesis.

Methods: Inclusion criteria were determined by review of existing literature on CH. The electronic medical record and gastroenterology notes were searched over 5.5 years for terms related to CH. Two investigators reviewed records to determine eligibility. The medical records of 98 included patients were reviewed and abstracted by a single investigator.

Results: The majority (67 %) of patients were male. Mean $\pm$ SD age at evaluation was 32.3 ± 9.9 years. Twelve percent of patients were obese by body mass index. Fifty-nine percent of patients used cannabis on a daily basis; 95 % used cannabis more than once per week. All patients reported nausea and vomiting, of which 86 % had associated abdominal pain. Most patients (71 %) had nausea and vomiting in the morning. In those with abdominal pain, 61 % had epigastric pain and 23 % described periumbilical pain. Most (64 %) of patients had normal bowel habits. Of the 57 patients with documented effects of hot showers or baths on symptoms, 91 % reported relief of symptoms with hot water bathing. The mean weight loss was 14.2 kg, with weight loss occurring in 83 % of patients. A wide variety of diagnostic testing was performed in most patients and was negative for alternative causes of symptoms. Of the ten patients for whom follow-up was available, three did not stop using cannabis and continued to have symptoms, six abstained and had complete resolution, and one stopped

using for 1 month without improvement before being lost to follow-up.

Conclusion: Long-term users of cannabis with recurrent nausea, vomiting, and abdominal pain should have the diagnosis of CH considered. Patients should be questioned about relief of symptoms with hot showers or baths, a common feature. Cessation of cannabis use should result in clinical improvement. The authors recommend further study with higher rates of follow-up and validation of proposed diagnostic criteria.

Critique: Thirty percent of patients included in this series had delayed gastric emptying on scintigraphy, which may suggest an alternative diagnosis. Repeat gastric emptying studies after cannabis cessation would have been valuable. This study was retrospective and based at a single tertiary center, which limits the generalizability of findings, despite patients originating out-of-state. Follow-up in the study was extremely limited, limiting the strength of association between ongoing cannabis use and persistent symptoms.

Implication for Toxicologists: Toxicologists should be familiar with the developing body of literature on cannabinoid hyperemesis and clinical features of this syndrome.

Robert N.E. French and Anne-Michelle Ruha

Griffith EA, Fallgatter KC, Tantama S, Tanen DA and Matteucci MJ. Effect of Deferasirox on Iron Absorption in a Randomized, Placebo-Controlled, Crossover Study in a Human Model of Acute Supratherapeutic Iron Ingestion. Annals of Emergency Medicine 2011;58 (1):69-73

Background: Currently, the treatment of iron toxicity involves the use of deferoxamine, an intravenous iron chelator. Deferasirox is an orally administered chelating agent that was approved by the FDA in 2005 for the treatment of chronic iron overload.

Research Question: Does deferasirox, administered orally 1 h after iron ingestion, reduce serum iron levels?

Methods: This was a double-blind, placebo-controlled, crossover study that compared deferasirox with placebo after an ingestion of 5 mg/kg elemental iron.

Eight subjects enrolled. Baseline serum iron levels were obtained. Each subject ingested 5 mg/kg of elemental iron and then, 1 h later, received either 20 mg/kg deferasirox or placebo. Serum iron concentrations were measured serially for 24 h. Two weeks elapsed between each arm.

Area under the iron concentration–time curves were calculated from 1 to 12 h and from 1 to 24 h and compared between study arms.

Results: Areas under the iron concentration–time curves from 1 to 12 h and 1 to 24 h were significantly lower in the deferasirox treatment arm. Sixty percent of subjects experienced nausea and abdominal cramping within 1 h of the iron dose, but all subjects completed the study.

Conclusion: The study demonstrated a significant decrease in iron levels when deferasirox was administered orally after supratherapeutic iron ingestion.

Critique: This study evaluated the use of an orally administered iron chelator in the setting of an experimental acute, supratherapeutic iron ingestion. Authors included a thorough limitations section. The most important limitation was the iron dose which was considerably lower than what would be expected to produce significant toxicity; an ethical necessity.

Implications for Toxicologists: Current management of acute iron ingestion involves a period of observation for development of gastrointestinal symptoms prior to instituting chelation therapy. Early administration of an oral iron chelator that prevents or limits iron toxicity could benefit high-risk patients (i.e., those who are known to have ingested a toxic dose). However, it is unclear how practical the administration of an oral iron chelator will be in the clinical setting of a toxin with high incidence of gastrointestinal manifestations. Even at the low dose of iron used in this protocol, subjects experienced nausea and cramping. Further study with actual overdose patients will delineate tolerability and effectiveness of such an oral antidote.

Robert N.E. French, M.D. and Anne-Michelle Ruha, M.D.

Pizon AF, Jan DH and Wang HE. The In Vitro Effect of n-Acetylcysteine on Prothrombin time in Plasma Samples from Healthy Subjects. Academic Emergency Medicine 2011;18:351-354.

Background: N-acetylcysteine (NAC) is used in the treatment of acetaminophen toxicity. The prothrombin time (PT) is a marker of hepatic function and is used as a prognostic factor when evaluating patients for liver transplantation. However, in the setting of acetaminophen

toxicity, minor prolongation of the PT is sometimes seen in the absence of other signs of hepatotoxicity. Intravenously administered NAC may be responsible for this prolongation.

Research Question: In an in vitro model using plasma from healthy human subjects, does NAC affect the PT?

Methods: This was an in vitro experiment using plasma from healthy volunteers. Plasma from each volunteer was divided into four separate samples. To each of three samples from each volunteer, NAC was added to obtain concentrations of 100, 500, and 1,000 mg/L, simulating the concentrations obtained at various times during NAC infusion. A fourth sample served as a control. Because IV NAC contains 0.5 mg/mL edetate disodium (EDTA), the effect of EDTA on PT was also measured by adding 5 μ L of 0.05 % EDTA to 1 mL samples from four subjects. The samples were incubated at 37 °C for 1 h then PT was measured.

Results: Thirty-three subjects were included in the NAC study. PT values increased with increasing NAC concentrations. Compared to control, for each concentration of NAC (100, 500, and 1,000 mg/L), the PT increased 0.3 (0.2–0.5), 1.5 (1.4–1.7), and 3.5 (3–3.9) s, respectively. EDTA did not raise the PT significantly.

Conclusion: This study demonstrated in vitro prolongation of the PT by NAC in plasma from healthy subjects.

Critique: This in vitro study involving healthy subjects nicely demonstrated mild prolongation in PT with increasing concentrations of NAC, and a lack of effect with EDTA alone. The concentrations used were consistent with concentrations encountered clinically.

Implications for Toxicologists: This study provides some reassurance that, in patients receiving NAC that have no other clinical or laboratory indication of hepatic toxicity, a mild prolongation in the PT may be an expected finding. An in vivo study may be warranted to confirm this effect.

Conflict of interest There are no conflicts to declare.

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