Poisoning and Overdose: Interesting Illinois Poison Center (IPC) Cases

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- The presenters have no conflicts of interest to report

Learning Objectives for Pharmacists

1. Identify two atypical but characteristic presentations of cannabinoid use and abuse.
2. Describe factors associated with an increased risk of liver injury in the setting of supratherapeutic or acute on chronic acetaminophen toxicity.

Learning Objectives for Technicians

1. Identify unexpected symptoms that can result from use and abuse of synthetic marijuana and cannabis.
2. Describe how taking acetaminophen for a viral illness may increase the risk of liver damage.

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Illinois Poison Center

- 77,000 cases annually
- 72,000 exposures
  - Nearly 25,000 from HCF
- 24 Clinical staff
  - Mostly pharmacists and nurses, all specially trained in toxicology
- Medical Toxicologist on call 24/7

Case #1

Unexplained bleeding

Mid-March 2018, a father and son present to a Chicago hospital ED with bruising, hemoptysis and hematuria.

Son

INR >20 PTT 108.7 Hgb 16

Father

INR 10 PTT 85 Hgb wnl

No pertinent PMH.

Neither are on any anticoagulants.

Coags improve with FFP and Vitamin K.

Upon questioning, both admit to cleaning out a storage unit 2 days previous that was noted to have a large amount of rat stool and rat poison present.

IPC notified local health department to report potential unsafe use of pesticide.

1 week later…

- Patient with substance abuse history presents to suburban ED with hematuria, hematemesis, INR 14.6. On no anticoagulants. Coags improve with vitamin K and FFP. Admits to **synthetic cannabinoid use**.
- Suburban Hematologist calling about patient with unexplained coagulopathy in a patient with substance abuse history: hematuria x 1 week and INR of 16. On no anticoagulants. **Admits to synthetic cannabinoid use**.

4 cases

- Initial two patients are re-interviewed and both admit to **synthetic cannabinoid use**.
- IPC notifies state health department.

Synthetic cannabinoids (SCs)

- Cannabinoid receptor agonists (THC Homologs)
- Symptoms
  - Alteration in mood/perception, euphoria
  - Agitation
  - Paranoia and hallucinations
  - Hypertension, seizures, hyperthermia, cardiac effects

Public Health Effort: IPC and IDPH

- Request for information issued to Illinois healthcare providers
- Risk communication to the public through media releases
- Data collection
- Clinical guidelines
- Antidote procurement

Morbidity and Mortality Weekly Report (*MMWR*)

CDC > MMWR

Notes from the Field: Outbreak of Severe Illness Linked to the Vitamin K Antagonist Brodifacoum and Use of Synthetic Cannabinoids — Illinois, March–April 2018

Weekly / June 1, 2018 / 67(21);607–608

Erin Moritz, PhD[1,2]; Connie Austin, DVM[2]; Michael Wahl, MD[3]; Carol DesLauriers, PharmD[3]; Livia Navon, MS[2,4];

- Over 180 cases reported to IPC to date
- 5 deaths
- Laboratory testing confirmed the presence of brodifacoum in all analyzed specimens

Coumarins and Vitamin K1

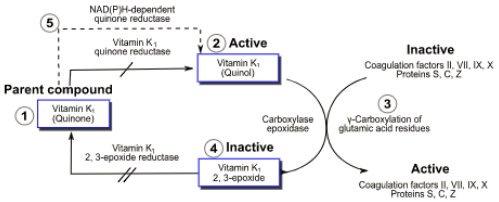

Figure used with permission from the Minnesota Poison Control System

Brodifacoum

- High doses of vitamin K needed to reverse coagulopathy
  - Begin at 50mg TID
- Half life
  - Warfarin 20-60 hours
  - Brodifacoum 15-56 days

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Outpatient Guidance for Coagulopathy Associated with Synthetic Cannabinoids

WHY Brodifacoum???

Case #2

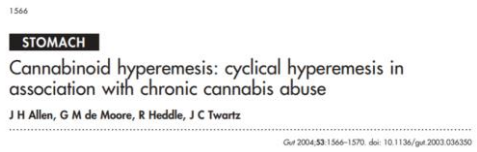
Unexplained vomiting

18y/o patient presents to the ED c/o vomiting x 4 days. Takes multiple "hot showers" per day which seem to relieve symptoms.

No PMH or meds. Admits to smoking marijuana 4-5 times daily.

PE and labs remarkable only for Na 129; Cl 91

Cannabinoid Hyperemesis Syndrome (CHS)

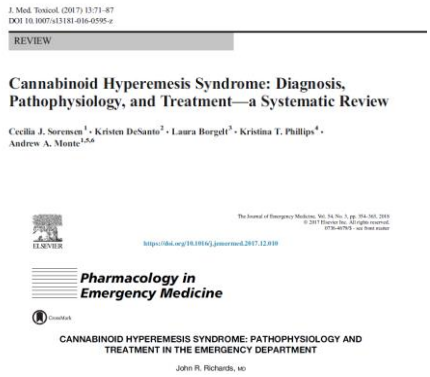

1566

STOMACH

Cannabinoid hyperemesis: cyclical hyperemesis in association with chronic cannabis abuse

J H Allen, G M de Moore, R Heddle, J C Twartz

Gut 2004;53:1566–1570. doi: 10.1136/gut.2003.036350


J. Med. Toxicol. (2017) 13:71–87
DOI 10.1007/s13181-016-0595-z

REVIEW

Cannabinoid Hyperemesis Syndrome: Diagnosis, Pathophysiology, and Treatment—a Systematic Review

Cecilia J. Sorensen[1] · Kristen DeSanto[2] · Laura Borgelt[3] · Kristina T. Phillips[4] · Andrew A. Monte[1,5,6]

Pharmacology in Emergency Medicine

CANNABINOID HYPEREMESIS SYNDROME: PATHOPHYSIOLOGY AND TREATMENT IN THE EMERGENCY DEPARTMENT

John R. Richards, MD

CHS

- Cyclic nausea and vomiting episodes
- History of frequent/regular cannabis use
- Symptom relief from hot water bathing
- Abdominal pain
- Resolution with cessation of cannabis use

Image removed due to copyright

Figure 1; p 356 from

Richards JR. Cannabinoid Hyperemesis Syndrome: Pathophysiology and Treatment in the Emergency Department. *J Emerg Med*. 2018 Mar; 54(3): 354-363.

Treatment

- Topical therapy
  - Hot water bathing
  - Capsaicin
- Parenteral drugs
  - Dopamine antagonists
  - Serotonin antagonists
  - Benzodiazepines
- **Cessation of cannabis use**

Case #3

Perfect storm

ED presentation

Yesterday, 3 y/o child accessed a box of 160mg APAP chewable tablets and ingested an unknown amount.

Child was reportedly lethargic and vomiting in the morning prior to the ingestion in the afternoon.

He had been receiving one 160mg APAP chew tab intermittently for flu-like symptoms for several days.

- By tablet count, 16 x 160mg tablets are missing from box but parents had used some previously.
- Weight 13kg

ED presentation, cont.

PE: mildly lethargic, otherwise unremarkable

Labs:

APAP undetectable

AST 1502 ALT 1411

INR 2.7 PTT 33 Tbili 1.9

Lactate 4.9

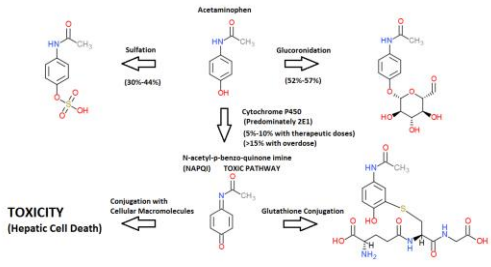
BMP: 135/4.2/107/18/12/0.51

IV NAC started

Hospital Course

- LFTs peaked in the 10,000's
- INR peaked at 6.3
- Transferred to transplant center
- Remained on NAC x 8 days

APAP Toxicity: A review



N-Acetylcysteine

- Alternate substrate for NAPQI
- Maintain/restore glutathione levels
- May also lead to increased substrate for nontoxic sulfation

Discussion of case

- Triage dose for pediatric acetaminophen ingestion: 200mg/kg
- This patient
  - 160mg tabs x 16 for 13kg = 197mg/kg

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ACETAMINOPHEN
CHRONIC OR REPEATED SUPRATHERAPEUTIC INGESTION

Patients **under 6 years of age should be referred** for emergent evaluation if they have ingested:
1) 200 mg/kg or more over a single 24-hour period
2) 150 mg/kg per 24-hour period over the preceding 48 hours
3) 100 mg/kg per 24-hour period over the preceding 72 hours

Excess APAP in the setting of viral illness

- Less electron donors (e.g. glutathione) to detoxify NAPQI
- Inflammatory oxidant stress

The New York Times Magazine

DIAGNOSIS

Was This a Virus, or Something More Dangerous for Her — and Her Fetus?

CHICAGO'S VERY OWN WGN9

Woman's simple mistake while battling illness leads to liver failure

COWETA COUNTY, Ga. - FOX 5 News has learned more about the Georgia teen who passed away this week while being treated for the flu.

A review of the evidence concerning hepatic glutathione depletion and susceptibility to hepatotoxicity after paracetamol overdose

This article was published in the following Dove Press journal:
Open Access Emergency Medicine
22 December 2011
Number of times this article has been viewed

Sarbjeet S Kalsi[1,2]
Paul I Dargan[3,4]
W Stephen Waring[5]

Abstract: Paracetamol (acetaminophen) poisoning is common throughout the world. The management of nonstaggered (acute) paracetamol overdose is based on the plasma paracetamol concentration plotted on a treatment nomogram. In the UK there are two treatment lines on

Considerations when evaluating for APAP toxicity

- APAP use over past several days
- Acute illness
- Eating disorder
- Chronic excess ethanol use
- Medications
  - e.g. INH, phenytoin, barbiturates, carbamazepine

Assessment Question

The mechanism of action for brodifacoum toxicity is most similar to which of the following?

a) THC
b) Acetaminophen
c) Warfarin
d) Phenytoin

Assessment Question

Which of the following can increase the potential for toxicity for an acute acetaminophen ingestion?

a) Concurrent therapeutic doses of ibuprofen
b) Concurrent use of a strong CYP2E1 inducer
c) Concurrent viral illness
d) A and C
e) All of the above

Assessment Question

Which of the following can contribute to increased risk of liver injury when taking acetaminophen during a viral illness

a) Poor oral intake resulting in decreased glutathione stores
b) Acute illness leading to inflammatory oxidant stress
c) Therapeutic errors can result in supratherapeutic doses of acetaminophen
d) All of the above

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