

Pediatric THC Updates

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DISCLOSURE

- I have no financial relationships to disclose
- My opinions are my own and do not reflect those of Ochsner Health Foundation, the University of Queensland, or the Minnesota Poison Control Center

Outline

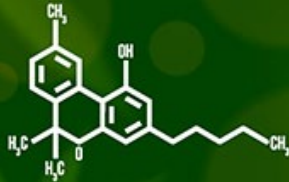
- THC History, Epidemiology, Pharmacology
- Trends in Pediatric THC exposure after legalization
- Clinical Effects in Pediatric THC overdose
- Cannabinoid Hyperemesis Syndrome

THC History

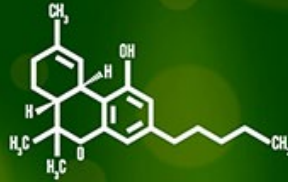
- Cannabis used therapeutically for 4000 years
- THC first isolated in 1964
- delta-9-THC first synthesized in 1967

THC Pharmacology/Pathophysiology

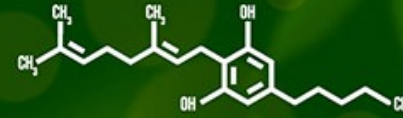
THE LIST OF CANNABINOIDS



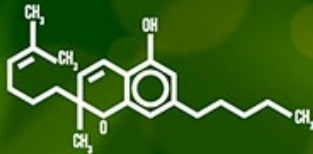
CBN
cannabinol



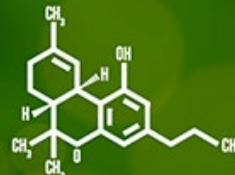
THC
tetrahydrocannabinol



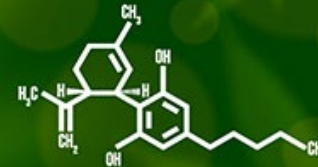
CBG
cannabigerol



CBC
cannabichromene



THCV
tetrahydrocannabivarin



CBD
cannabidiol

THC Pharmacology/Pathophysiology

- *Cannabis (sativa and indica)*
- Over 60 cannabinoids
- THC is the principal psychoactive compound

THC Pharmacology/Pathophysiology

- *Marijuana* dried leaves and flowers of *C. sativa*
 - 1% THC in low potency
- Hashish/Hash/Hash oil
 - Up to 50% THC
- THC extracted from marijuana using butane approaches

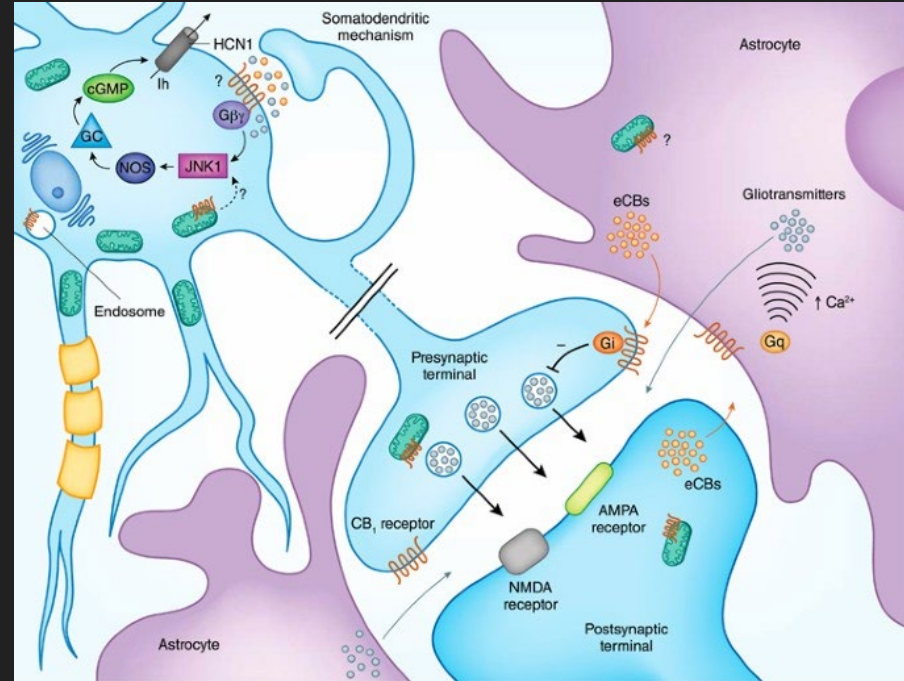
100%

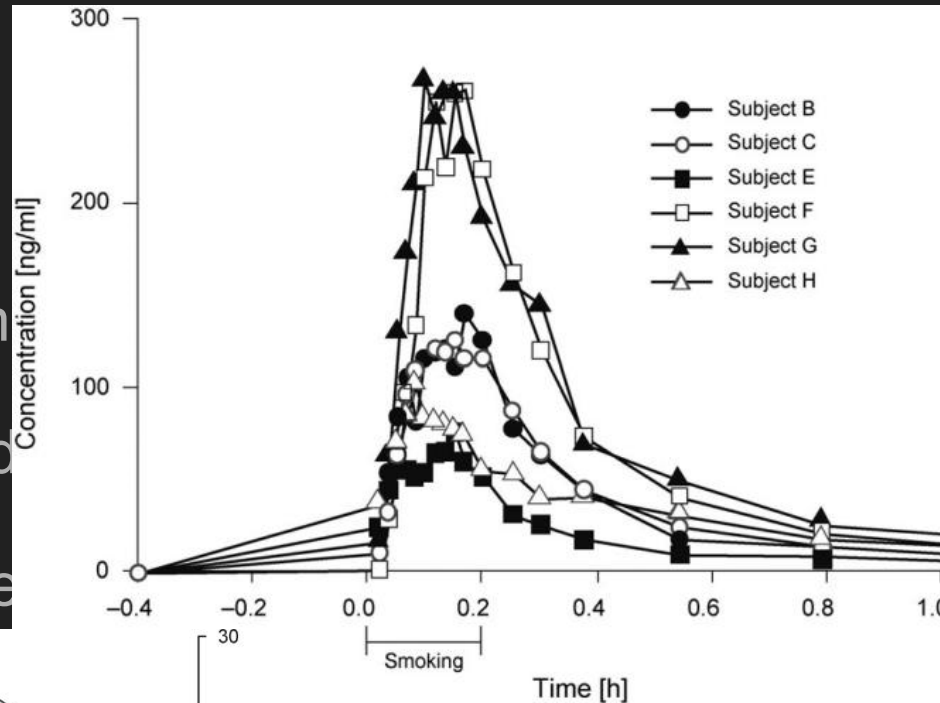
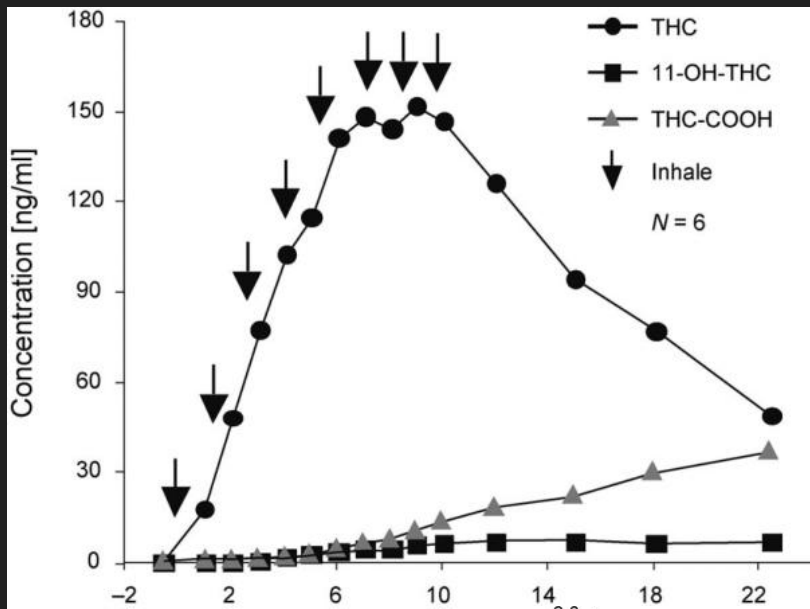
THC Pharmacology/Pathophysiology

- CB1 receptors - G-coupled transmembrane protein
 - Psychoactive effects
- CB2 receptors
 - Studied target for anti-inflammatory agents

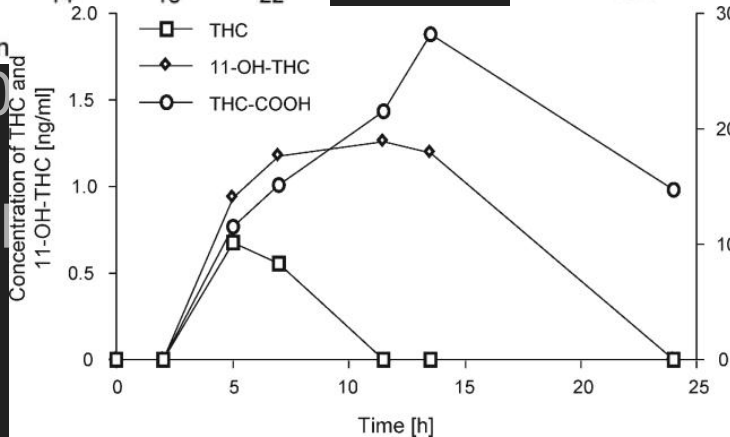
CB1 Receptors

- Most numerous G-coupled receptors in mammalian brain
- Highest concentration in areas associated with movement, cognition, emotion
- Relative lack in brainstem
 - Lack of respiratory depression and coma with *therapeutic* use





○ 5-20
○ Peel



Concentration of THC-COOH [ng/ml]

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THC in pregnancy and breastfeeding

- THC is lipid soluble and concentrates in breastmilk

THC Pathophysiology

- Decreases in coordination, concentration, reaction time
- Weakness
- Loss of hand steadiness
- Lethargy
- Sedation
- Postural Hypotension

Acute Pediatric THC Toxicity

- Common

- Obtundation
- Tachycardia

- Less Common

- Apnea
- Cyanosis
- Bradycardia
- Hypotonia
- opisthotonus

Trends in Pediatric Exposure

- Legalization in CO in 2012

Original Investigation

ONLINE ONLY | FREE

Conclusions and Relevance Colorado RPC cases for pediatric marijuana increased significantly and at a higher rate than the rest of the United States. The number of children's hospital visits and RPC case rates for marijuana exposures increased between the 2 years prior to and the 2 years after legalization. Almost half of the patients seen in the children's hospital in the 2 years after legalization had exposures from recreational marijuana, suggesting that legalization did affect the incidence of exposures.

» Author Affiliations | Article Information

Wang et al. continued

- 81 Children 0 - 9 years old
- 83% unintentional exposures
- 48% Edible infused products
- 34% 'improperly stored'
- 61% treated in a hospital
- 3% Major Effects
- 1 death in an 11 month old

Trends in Pediatric THC exposure

Pediatric Edible Cannabis Exposures and Acute Toxicity: 2017–

2021 **FREE**

Marit S. Tweet, MD ; Antonia Nemanich, MD; Michael Wahl, MD

CONCLUSIONS

There has been a consistent increase in pediatric edible cannabis exposures over the past 5 years, with the potential for significant toxicity. It is important for providers to be aware of this in their practice and it presents an important opportunity for education and prevention.

NATIONAL POISON DATA SYSTEM™

POISONING CASES

(last 30 days)

202,895

COVID-19 BULLETINS

The National Poison Data System (NPDS)™ tracks exposures happening across the country in near real-time. In response to COVID-19, poison centers also track specific exposures including hand sanitizers and cleaning products. Click the buttons below for the latest COVID-19 bulletins.

BLEACHES

HAND SANITIZERS

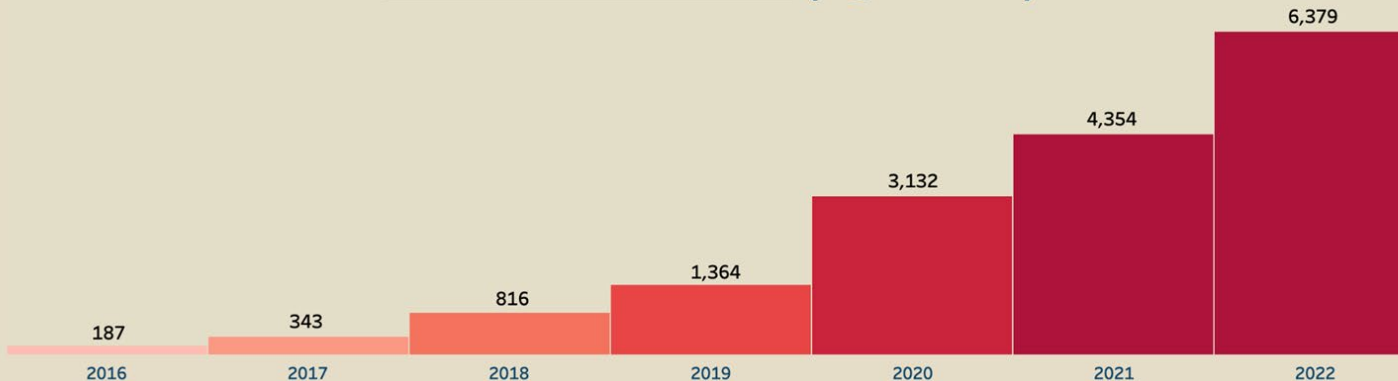
IVERMECTIN

DISINFECTANTS

[CLICK FOR MORE POISON CENTER DATA](#)

Recent Category Profile

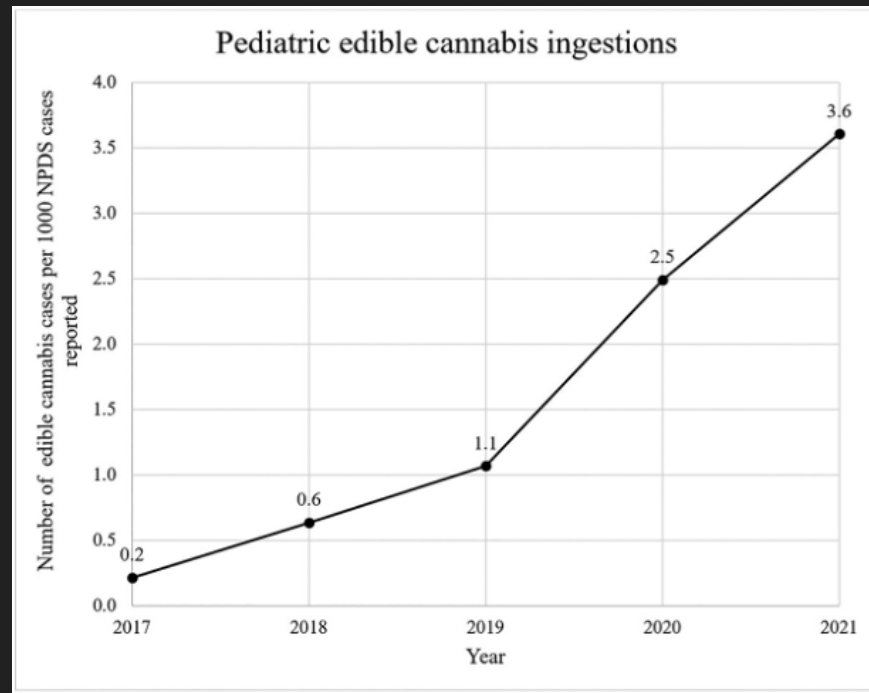
CANNABIS EDIBLES (Ages 0-12)



2020	2021
8.2	9.0
14.9	16.3
32.6	35.9
10.3	8.7
17.0	16.4
17.0	13.7

Tweet, et al. continued

- CNS depression 70%
- Respiratory depression 3.1 %
- Hypotension 2.5%
- Seizure 1.6%
- 0 deaths



Pediatric THC Overdose Management

- 20 most common treatment modalities

Fluids, intravenous	997 (20.7)
Dilute/irrigate/wash	525 (10.9)
Food/snack	495 (10.3)
Oxygen	193 (4.0)
Benzodiazepines	107 (2.2)
Charcoal, single dose	100 (2.1)
Antiemetics	97 (2.0)
Other emetic	96 (2.0)

Pediatric THC Overdose Management

- 20 most common treatment modalities

Naloxone	68 (1.4)
Potassium	51 (1.1)
Intubation	35 (0.7)
Ventilator	33 (0.7)
Antibiotics	26 (0.5)
Anticonvulsants	20 (0.4)
Sedation (other)	17 (0.4)
Glucose, >5%	14 (0.3)

Pediatric THC Overdose Management

- 20 most common treatment modalities

Vasopressors	13 (0.3)
Flumazenil	7 (0.1)
Antihistamines	5 (0.1)
Neuromuscular blocker	5 (0.1)
Opioid analgesia	5 (0.1)
Ventilation, noninvasive (CPAP, BiPAP)	4 (0.1)

BiPAP, bilevel positive airway pressure; CPAP, continuous positive airway pressure.

THC Dosing Considerations

The Form and Content of Cannabis Products in the United States

*Stacey Steigerwald, MSSA¹, Peggy O. Wong, BA¹, Arianne Khorasani, BA²,
and Salomeh Keyhani, MD, MPH^{3,4}*

- A typical adult dose of THC in edible form is 2.5-10mg
- Recreational states have defined limits on dose per package (50-100)mg and serving (5-10mg)
- Limits on marketing appealing to children exist, but unclear if/how enforced
- Unclear limits on non-edible formulations

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- Packages in this study ranged from 5-7000mg



THC Edible Packaging



“Cheeba Chews Review: Quad Dose, Deca Dose & CBD.” 2021. *NuggMD* (blog). sigmabold. January 4, 2021. <https://www.nuggmd.com/blog/cheeba-chews-review>.

THC Edible Packaging



“1000mg TWIX OG Cookie Bar(Chocolate, Crispy Cookie, Caramel).” n.d. Accessed July 1, 2024.
<https://www.freshdino.co/product/1000mg-twix-og-cookie-bar-chocolate-crispy-cookie-caramel/>.

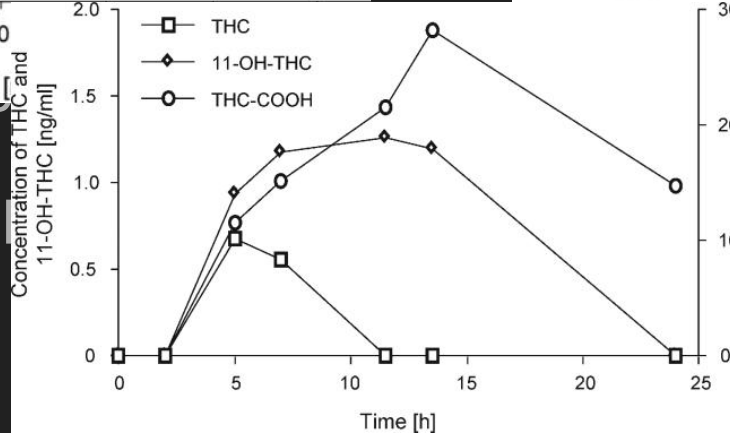
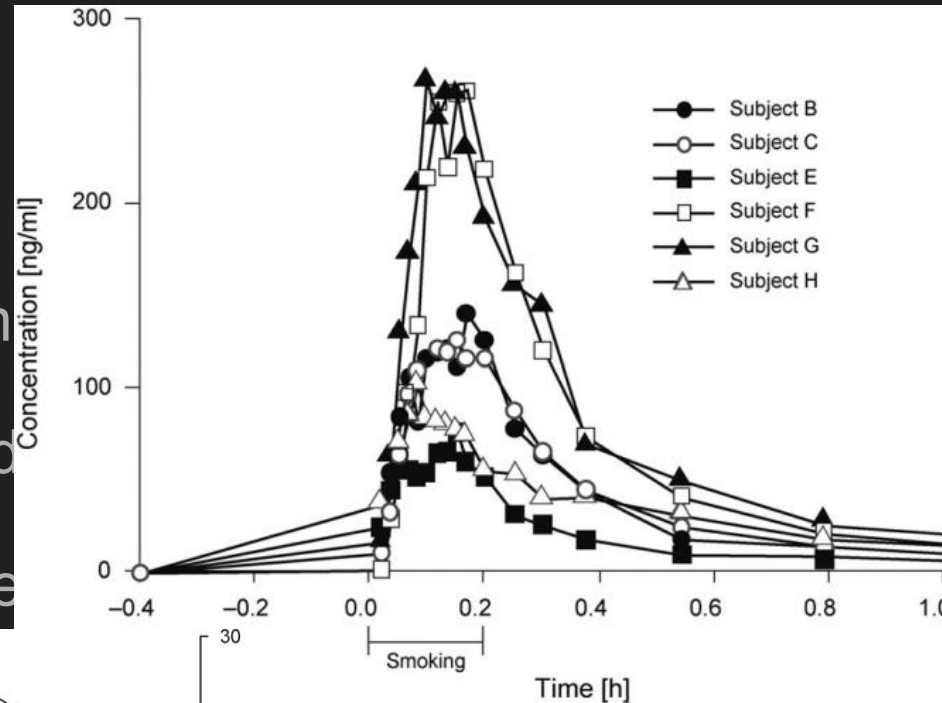
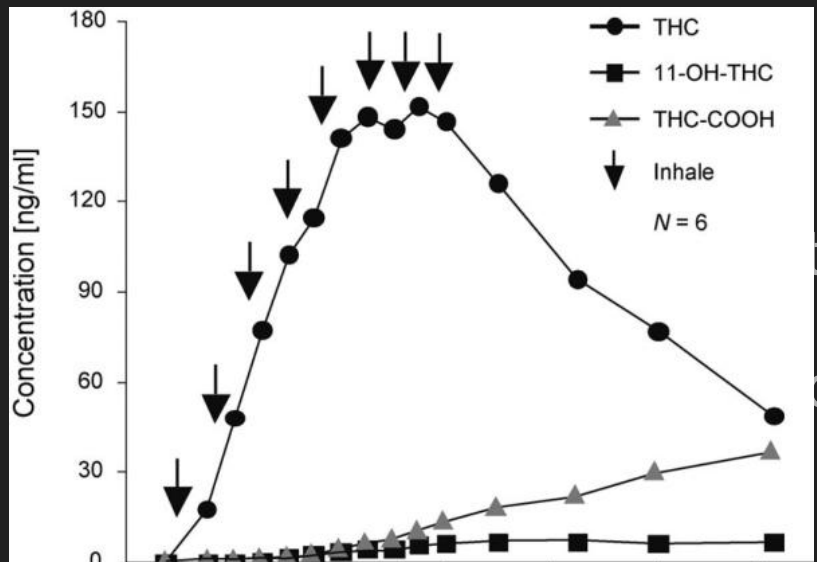
THC Edible Packaging



“50MG Dank Dude Tallboy.” n.d. Realbudz. Accessed July 1, 2024. <https://realbudz.com/product/50mg-dank-dude-tallboy/>.



““The Boldest Flavors in Cannabis at the Best Prices.” 2023. Dizzies. June 14, 2023. <https://funwithdizzies.com>.”



Pediatric THC Overdose Summary

- Increasing in frequency
- Potentially large overdose
- Wide range of CNS, Cardiovascular, GI, etc. effects
- ~8% ICU admission rate
- Death Unlikely

American College of Medical Toxicology Position Statement

- Child resistant packaging
- No marketing to children
- Require THC concentration, content, serving size, THC per serving and Poison Control # on labeling
- Do not use cannabis in front of children
- Store THC products securely
- Do not administer cannabis to children without medical oversight
- Do not use THC products while pregnant or breastfeeding

American Academy of Pediatrics Policy Statement

- Opposes medical marijuana use outside of FDA process
- Opposes Legalization due to harms to children and adolescents
- Enforce rules in legalized states limiting access and marketing to children
- Cannabis should be regulated similar to tobacco and alcohol
- Childproof packaging
- Supports decriminalization
- Opposes smoked marijuana due lung damage and unclear secondhand smoke effects
- Opposes use by adults in the presence of minors

How California's legal cannabis dream became a

p **“Scromiting,” the New Panic Over Weed, Is Actually a Real Thing**

Cannabinoid hyperemesis syndrome is rare but can involve severe or prolonged vomiting. Experts say it's no reason to restrict marijuana use.

One more topic...

CANNABINOID HYPEREMESIS SYNDROME (CHS)

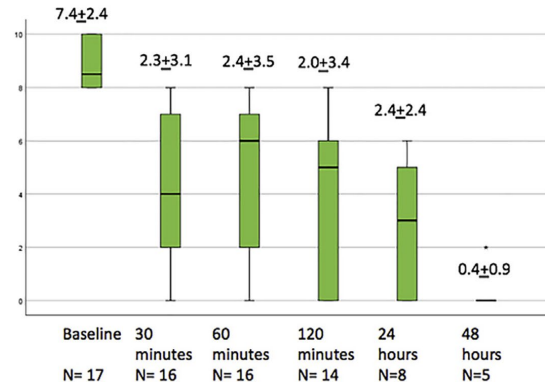
Rome IV criteria

- a. Criteria fulfilled for at minimum three months, with symptomatic onset occurring at least six months before diagnosis
- b. Stereotypical episodic vomiting resembling cyclical vomiting syndrome in onset, duration, and frequency
- c. Presentation after prolonged, excessive cannabis use
- d. Relief of vomiting by a sustained cessation of cannabis use
- e. May be associated with “pathologic” bathing behavior, e.g., prolonged hot baths and showers.

CANNABINOID HYPEREMESIS SYNDROME (CHS)

- Haloperidol appears superior to Ondansetron in the ED
- Droperidol appears superior to both in the ED
- Mixed data for topical capsaicin to upper abdomen
- Counseling for cessation and amitriptyline as outpatient

Mean Visual Analog Scale (VAS) for Nausea and Emesis from Presentation to 48 Hours



SUMMARY

- Pediatric THC exposures are increasing
- Pediatric THC overdose can present with diffuse symptoms of varying severity
- Supportive Care is typically adequate
- Marketing, Packaging, Use in front of children is an area of public health focus
- Cannabinoid Hyperemesis Syndrome should be considered when appropriate
 - Management options include droperidol, capsaicin, amitriptyline, and counseling

Questions?

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