99 Problems but hyperglycemia “ain’t one”

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17 yo F reported intentional overdose
“handful” of her mother’s pills (15-30)
Etoh 0.2
UDS: cannabinoids
Tylenol: negative
Salicylates: negative

Could include:
- Metformin 1000 mg
- Lisinopril
- Simvastatin
- Flexeril
- Ibuprophen
Agenda

- Case presentation
- Toxidromes
- Clinical Pearls
  - Inpatient medicine
  - Outpatient medicine
Oh yeah... AND

- Transferred from OSH
- Hypoglycemic to 46
- Given 12 amps of D50 en route
- HCG positive (news to patient)
- OB u/s: estimated gestation 9 wks.
- Mother not reachable....
INGESTIONS

- R  Resuscitation
- R  risk assessment
- S  supportive care
- I  investigations
- D  decontamination
- E  enhanced elimination
- A  antidotes
- D  disposition
Case Presentation

- Repeated POC glucose to 40s despite D50
- Placed on a D10 drip
- Thiamine... then FLUIDS FLUIDS
- Telemetry
- Brief vasopressors
- Involuntary Hold
- Suicide & Seizure precautions
- STAT OB/gyn consultation
Case presentation

- EKG: prolonged QT interval greater than 500
  - Slightly long QRS
- Already given charcoal
- Anion gap resolved
- However hypoglycemia and somnolence persisted.
# Metformin

## Facts of Use
- First line for DM type II
- Contraindicated in CKD:
  - Cr > 1.4 mg/dl WOMEN
  - Cr > 1.5 mg/dl MEN
- Renal Clearance
- Absorbed in small intestine
- Not plasma bound
- Peak concentration 2-3 hrs

## Toxic events
- **2009:**
  - 7128 toxic exposures
- **2009:**
  - 7 deaths
- **0.098 % mortality rate**
- Risk increases with
  - Decreasing renal function
  - Impaired hepatic disease
## Metformin Toxicity

### Case
- Markedly hypoglycemic
  - Likely some other cause than metformin
  - Perhaps combination drug with sulfonylureas
- Lactic acidosis: 4- then 1.6.

### Literature
- Lactic acidosis
  - Promotes glucose -> lactate in small intestine
  - Inhibits mitochondrial respiratory chain complex 1= decreased hepatic gluconeogenesis from lactate, pyruvate, and alanine
  - In severe cases can consider Hemodialysis- due to renal clearance
Chronic Metformin Toxicity

- Exceedingly rare
- Almost always associated with:
  - Decreased renal clearance
  - Hepatic disease
  - Active alcohol abuse
  - Unstable/acute heart failure
  - Hypoxic states/Hemodynamic instability

Flexeril (Cyclobenzaprine)

TCA Toxidrome... OR

Anticholinergic?

[Chemical structures of Cyclobenzaprine and Amitriptyline]

Cyclobenzaprine
Amitriptyline
## Cyclobenzaprine Toxicity

### TCA Toxidrome
- Wide complex tachycardia
  - (NA channel blockade)
- Hypotension
  - (alpha blockade)
- Seizures refractory to benzodiazepines
  - (GABA antagonism)

### Anticholinergic
- Sedation
- Tachycardia
- Hypertension
- Urinary retention
- Blind as a BAT
- Mad as a Hatter
- Red as a Beet
- Hot as Hades
- Dry as a Bone

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Cyclobenzaprine Toxicity
Clinical Pearls

Agitated delirium: AVOID HALDOL

SEIZURES: benzodiazepines

Hyperthermia: cooling techniques

Cardiac arrhythmias: Sodium bicarbonate infusion

More Anticholinergic symptoms than TCA symptoms
Physostigmine

- Carbamate acetylcholinesterase inhibitor – prevent peripheral & central toxicity
- Reserved for severe agitation of Anticholinergic syndrome
- Controversial
  - Cases of Asystole after physostigmine administrations
  - QRS was > 0.1 sec
  - Cardiac monitor and code cart at bedside
Lisinopril

- Cough, bronchoconstriction, angioedema – known side effects – rare in overdose
- Marked Hypotension
  - Supportive care
- Considerations:
  - Naloxone
  - Angiotensin II
Case Presentation

- 48 hrs later:
  - Improved mentation
  - Vasopressors discontinued
  - Able to transition off D10 infusion to food
  - Ultimate disposition: Psychiatric evaluation
  - OB/GYN follow up
“Right now I take a blue pill, a purple pill, an orange pill, a white pill, and a yellow pill. I need you to prescribe a green pill to complete my collection.”
Thank you for your time