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Drugs of Abuse – GHB

Case: A middle-aged male is brought in by EMS after being found slumped over his steering wheel at a 4-way stop. He has not been seen at the institution previously. At initial evaluation, pt is hemodynamically stable, has a normal pulse oximetry at room air, but is snoring, and is unarousable with sternal rub. The initial laboratory work-up is unremarkable and his urine toxicology screen for common drugs of abuse is negative. After roughly 30-40 minutes in the ED, he suddenly wakes up, is extremely confused and agitated, requiring >10 people to hold him down to prevent self-harm. He eventually calms back into a non-arousable state. In his belongings he has a half-empty Gatorade bottle – GHB?

Background

- GHB (Gamma-hydroxybutyrate) was initially an anesthetic agent in the 1960s, but its use was discontinued due to its undesirable side effects including clinical unpredictability, **myoclonus and emergence delirium**
- The drug, as sodium oxybate, has been approved for use in treatment of cataplexy and narcolepsy (Xyrem, requires a special training to prescribe).
- It is a schedule I substance, as are its precursors (GBL, 1,4-butanediol, etc) that are converted to GHB after entering the body
- **Recipes are readily available online**
- It has been sold as cleaner, paint stripper, nail polish remover, etc.
- It is purported to be a **growth hormone releaser, muscle builder, diet aid, hallucinogen, anti-depressant, and enhancer of sexual potency**
- Also has been used as a **"date rape" drug** due to it resulting in rapid loss of consciousness and amnesia.

Street Names

- Liquid ecstasy, Liquid X, Georgia Home Boy, G, Grievous Bodily Harm
- Similar to other new synthetic drugs of abuse, the "street" name is routinely changed.

How Does it Work?

- **It is and analogue of GABA**
- Easily crosses BBB → **rapid general anesthesia and respiratory depression**
- **Death is secondary to respiratory** causes → apnea, pulmonary edema, aspiration
- Effects are increased with co-consumption of EtOH and other CNS depressants
- Effects are seen within 10-15 minutes after oral use, 2-8 minutes after IV
- Effects peak w/in 25-45 minutes and last 1-2 ½ hours
- GHB is undetectable w/in 4-6 hours
- Of note, it also rapidly crosses the placenta

Toxicity

- From narcolepsy studies – 30mg/kg causes abrupt onset of sleep, enuresis, hallucinations, and myoclonic movements. At 50 mg/kg there is LOC. At 60 mg/kg patients are in deep coma.

- Co-ingestions reduce mg/kg needed for effects

The Patient Presentation
- **w/in 15 minutes – euphoria**
- **30-40 minutes – LOC and coma (most common presentation to ED)**
- **Brief period of delirium and agitation upon awakening**
- **Bradypnea w/ increased tidal volume**
- **Cheyne-Stokes, loss of airway reflexes**
- **Vomiting and incontinence**
- **Bradycardia is more common than tachycardia**
- **May see alkaline burns due to production leaving residual chemicals in the solution**

Withdrawal
- **Tremor, paranoia, agitation, confusion, hallucinations**
- **Tachycardic and hypertensive**
- May see symptoms within 2 hours in habitual users
- Symptoms may last 3 days to 2 weeks

Diagnosis
- **Suspect in patients presenting with coma and then rapidly recover**
- Laboratory test is not readily available, but should be considered in cases of drug-facilitated sexual assault ("date rape")
- Evaluating for co-ingestions may be helpful, e.g. EtOH and other CNS depressants

Treatment
- **Supportive management is crucial**
- Some pts may need brief intubation to protect airway (clinical decision)
- Physostigmine or neostigmine have been suggested as antidotes, but are not routinely recommended due to general lack of evidence
- There is no indication for the routine use of gastrointestinal decontamination
- Atropine can be used for hemodynamically significant bradycardia

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