Puppies in the PICU: Hallucinosis as a consequence of attempted suicide by stimulant overdose in an adolescent patient

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Introduction

Psychostimulants, including methylphenidate and mixed amphetamine salt derivatives, are among the most prescribed medications in child and adolescent psychiatry. Stimulant diversion and recreational use among adolescents and young adults remains a substantial concern. However, there are further risks in the overdose potential of this regularly prescribed medication class. **Hallucinations are an uncommon adverse effect of psychostimulant use**, which can be seen both at therapeutic doses and in overdose. In this report, we detail a case of newly observed hallucinations in an adolescent female following a suicide attempt by overdose on stimulants.

Case Report—History of Present Illness

- **15-year-old mixed race female (she/her)** who presented to the pediatric emergency room in May 2021 after **intentional ingestion** of her **brother's stimulant medication**
- Presented to outside hospital, patient ingested potentially over **180 tablets of Adderall**
  Bottle A: 5 mg, 90 tablets. Prescribed on 9/2020. **Empty**
  Bottle B: 5 mg, 90 tablets. Prescribed on 01/2021. **Empty**
  Bottle C: 15 mg XR, 30 tablets. Prescribed 2019. **(15 tablets left)**
- Per EMS, experiencing **visual hallucinations in ambulance**
- **Vitals and lab abnormalities notes** (tachycardic to 141bpm and hypertensive to 131/101mmHg, with a respiratory rate of 35bpm, elevated lactate, prolonged QTc)
- Treated with **IVF and PRN sedatives including benzodiazepines, Haldol, and Precedex**
- **Transferred to UMMC** for care after ongoing decompensation including lab and vitals instability, physical aggression
- At UMMC PICU, **talking to unseen others**
- **Child Psychiatry consulted** for recommendations for **"possible mania or schizophrenia given hallucinations"**

Patient Past History

- Birth/Development- Unremarkable
- Social- Lives at home with mother, sibling. Average grades. Enjoys cheerleading. **Vaped every day and had experimented with alcohol and cannabis socially.**
- Medical- **Two concussions related to athletics**, no neurologic insults. No standing medical diagnoses
- Diagnosed with **Major Depressive Disorder at 13 years old. No associated psychosis or** catatonia in her episodes of depression, of which mom reports she had experienced 3-4 decompensations of **moderate to severe severity.**
- **Two lifetime suicide attempts** since Fall 2020, made via cutting and intentional Benadryl overdose Self injurious behaviors including **cutting** since 2020
- **No prior inpatient admissions**
- Psychotropic medication trials **include Prozac 30 mg since November 2020**
- **Strong family history of psychiatric disorders** including affective disorders, substance use disorders, and attention deficit hyperactivity disorder

Consult Evaluation

Mental Status Exam (pertinent)

- Appearance- **Appears stated age, disheveled**
- Attention- **In and out of consciousness**
- Mood/Affect- **"sad and depressed", appears tired**
- Thought progress- Illogical
- Perceptual Disturbances- Referenced **a dog in the room** and became **afraid of unseen strangers**
- Thought content- **Mistook her evaluator** for multiple people from her life. Referenced **suicide attempt** with high levels of redirection. **Paranoid of unseen others.**

Presentation consistent with **hyperactive delirium versus an acute, transient, stimulant-induced psychosis**
Recommendations- **Delirium Protocol, 1:1 sitter, Seroquel PRN, consideration of admission and hold Prozac pending resolution of toxidrome**

Hospital Course

- Vitals, labs monitoring and management per PICU team and Poison Control
- **CT head completed**- "No acute intracranial abnormality. Early cerebral edema is difficult to exclude if suspected clinically however the brain parenchyma maintains normal attenuation."
- 3 days s/p overdose: Patient remained tired, **perceptual disturbances resolved**. Labs, vitals trending towards NL
- **Step down to medicine. Transferred to inpatient psychiatry.**

Discussion

Stimulant overdose should be included in the differential diagnosis of any suicidal pediatric patient presenting with new onset psychotic symptoms

- Stimulants are **notable targets of intentional overdose** in suicidal pediatric patients, especially among teenagers, whether or not they themselves have been prescribed them
- Stimulants might be associated with **attenuated suicide risk in the treatment of ADHD** as they decrease the risk of impulsive behaviors (10)
- The psychiatric effects in overdose occur due to altering monoamine transport at sites including the dopamine transporter, thereby increasing extracellular synaptic concentrations of dopamine, serotonin and norepinephrine
- Given increased dopamine as likely cause of hallucinations in overdose, **dopamine blocking antipsychotic medications** in the treatment of stimulant-induced hallucinosis, in addition to PRNs for management of vitals abnormalities
- In the wake of overdose, symptoms **generally resolve within 24-48hrs**, and "almost always" within 7 days (7)
- Consideration of family history is important as emergence of stimulant-induced psychosis in children is **enriched in the offspring of parents with severe mental illness** (11,12). Overdose may serve as "unmasking" of psychosis event (13)
- Further research required on long-term psychosis outcomes

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