Memantine Overdose: Recreational Supplementation resulting in Altered Mental Status

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LEARNING OBJECTIVES
• Recognize the growing phenomenon of recreational memantine use & online supplementation stores.
• Describe the observed symptoms of memantine overuse.
• Review the importance of multidisciplinary team members & collateral history.

INTRODUCTION TO MEMANTINE
• MOA: NMDA Receptor Antagonist
• FDA approved for moderate-severe Alzheimer’s disease
• Target max dose of 20mg/d
• “Neurocognitive enhancing” qualities & Hallucinogenic effects
• “Dissociative Trip” ~ Ketamine or Dextromethorphan misuse
• Reported dosages upwards to 15x greater than guidelines

CASE DESCRIPTION
A 40-year-old man with a medical history significant for insulin-requiring type 2 diabetes, bipolar disorder and polysubstance use disorder presented to the emergency department with altered mental status.

Prior to Hospitalization
• Brought in by his caseworker
• Unusual behavior, described as “walking around naked and getting into other housing resident’s beds”.
• Abstinent from substances for 18 months
• Living in transitional housing
• Employed by the housing facility in an administrative capacity.

Upon Admission
• Stared blankly ahead and appeared to be responding to internal stimuli
• Intermittently tearful and audibly crying throughout the encounter

This case illustrates the growing phenomenon of recreational memantine use as a neurocognitive enhancer.

We suspect that memantine overdose is underrecognized, as no constellation of clinical findings has been identified, and no metabolite is detected with toxicology screening.

Physical Exam
• Afibrile, BP 128/86, HR 101, RR 17
• Occasionally responded to “yes/no” questions.
• Unable to follow any commands.
• Oriented only to first name.
• Pupils were equal, round, and reactive to light.
• No focal neurologic deficits were detected, though the exam was limited by participation.

Laboratory Values & Imaging
• Elevated Anion Gap 17, Glucose 336→ suggestive of DKA
• Utox positive for prescribed Olanzapine & Temazepam
• Head CT did not suggest acute intracranial abnormalities

Hospital Course
12 hours since admission
• Anion gap closed
• Exam remains the same as admission

Hospital Day 2
• Mental status slightly improved and more interactive
• Oriented to self and season.
• Developed acute left-sided upper lip twitching every 30 seconds worsening with memory retrieval
• Slow saccades and dysmetria on finger-to-nose testing
• CN II-XII were intact with 5/5 strength & sensation.
• Head MRI did not suggest intracranial abnormalities
• EEG: diffuse slowing waves, no epileptiform changes
• No evidence of benzodiazepine withdrawal.
• Caseworker: found 5000mg memantine packet in room, labeled as purchased from an online supplement store.

Hospital Day 3
• Mental status continues to improve
• Patient endorsed use of memantine as adjunctive therapy for bipolar disorder and to improve memory.
• Upon discharge, engaged in conversation, speaking in full sentences.

References:
Link to voiceover presentation
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