

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

- Afebrile, 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.

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Link to voiceover presentation (4:06)

