

2-Methyl-2-Butanol intoxication

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Background

- 2-methyl-2-butanol(2M2B) known as Tert-amyl alcohol (TAA) was previously used in the past for its hypnotic, anticonvulsant, and sedative properties now there is a new emergence of recreational use.¹ Both ethanol and 2M2B stimulate GABA-A receptors causing similar CNS effects.¹
- 2M2B is a longer chain alcohol compared to ethanol and is known to have more sedative effects and has higher toxicity. The emergence of 2M2B as a replacement for alcohol can be due to its low cost per dose, high potency, and it's lack of residual side effects as it is not metabolized to aldehyde ("hangovers"). Users emphasize recreational effects like relaxation, euphoria and the reduction of anxiety.²
- Additional appeal to 2M2B includes the inability to detect the substance under normal urine drug screening or alcohol screening. This allows the use, or abuse, of this substance to occur without detection under normal circumstances.¹
- The 2M2B use among young people especially in Eastern Europe has been very popular. Other names for 2M2B are "Vodka", "Blue light". There has been a case in the past where a patient has abused it for drug resistant insomnia.²
- This case report describes the clinical course of a patient after intoxication with 2M2B and bringing awareness as it is difficult to confirm diagnosis since there are no specific clinical features and diagnostic labs that aid in diagnosing patient.

Discussion

- Diagnosis of intoxication in our patient was based on information by family members. The presentation of 2M2B intoxication is similar to ethanol toxicity. It is difficult to confirm diagnosis as there are no specific clinical features. Some of the common symptoms are urinary retention, low mood, reduced cognitive functioning, ataxia, and finally respiratory depression.¹
- The patient with 2M2B intoxication brings significant diagnostic challenges. Although easily detectable via gas chromatography-mass spectrometry (GC-MS), it can be difficult to diagnose in the hospital setting as routine urine toxicology screens do not have the ability to detect it.¹
- 2M2B is metabolized via the cytochrome p450 pathway. The lack of "hangover" symptoms is due to its lack of aldehyde conversion as seen with ethanol, making it more appealing to users.⁴
- The distinguishing factor between ethanol and 2M2B intoxication is duration of intoxication, elevated anion gap, and serum osmolality seen in 2M2B. The intoxication can last 12-24 hrs after consumption with 2M2B while ethanol intoxication is shorter in duration.¹ The anion gap and serum osmolality in our patient was normal which contradicts the theory.

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Case Presentation

- 41 year-old female with no significant past medical history was found altered on scene by EMS. She appeared apneic per EMS requiring intubation. She was admitted to the ICU for acute hypoxic/hypercapnic respiratory failure secondary to respiratory depression after ingestion of 2M2B. The EKG of the patient was noted to be in sinus rhythm.
- Levels of acetaminophen, salicylate, ethanol, isopropyl, and alcohol methyl were assessed, however, were normal. Urine drug screen was negative. Labs noted acute kidney injury with a creatinine of 1.36 - baseline was unknown.
- VBG noted metabolic acidosis (7.19/45.8/538/17.5). Although 2M2B has been known to cause increased osmolar gap and anion gap metabolic acidosis, patient's labs were negative for these findings. Poison control was consulted; recommended observation and supportive care. She was treated with intravenous normal saline, thiamine 100 mg/day, and folate 1 mg/day. Propofol was discontinued to monitor neurological status. Symptoms of intoxication gradually resolved and the patient was extubated on day two.
- Patient was a known recreational user of 2M2B, claiming it to be "liquid Viagra for women". She reported a lot of her friends using it for its high potency and its low cost compared to ethanol. Prior to discharge, the patient was educated regarding the hazards of 2M2B use. Resolution of cognitive status and motor functioning were observed and the patient was discharged on the third day of the hospital course.

Conclusion

- As the use of 2M2B increases, it is imperative that we educate our patients regarding the risk profile.

References

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