

Abstract

The opioid epidemic is ongoing across the nation and has been made more prevalent upon the introduction of xylazine, which impacts the approach healthcare providers take while caring for certain patients. Xylazine is a tranquilizer drug commonly utilized to sedate larger animals. Although xylazine itself is not an opioid, it has more regularly been detected within illicit substances such as heroin, meth, fentanyl, cocaine, and imitation prescriptions. Xylazine has come to be abused by drug users and drug traffickers, especially since xylazine is not considered a controlled substance based on the U.S. Controlled Substances Act.² The U.S. Drug Enforcement Administration (DEA) reported that 23% of all fentanyl powder and 7% of all counterfeit fentanyl pills contained xylazine in their active contents during 2022.² Case studies have shown peculiar characteristics in individuals who present with xylazine intemperance. Understanding the clinical presentation of xylazine intoxication will help the anesthesia care team (ACT) recognize the symptoms and appropriate treatment for this drug. The pharmacologic interactions between xylazine and other anesthetic modalities must be addressed. Anesthetists must know how to properly tend to patients as the unintended and intended use of xylazine increase in the U.S.

Introduction/Objectives

- Xylazine is referred to as ‘tranq’ or the ‘zombie drug’ and has a mechanism of action identical to premedex as an alpha-2 adrenergic agonist.³ Norepinephrine release is inhibited because of alpha-2 receptors within presynaptic sympathetic nerve terminals that transmit local negative feedback. This will largely result in bradycardia, hypotension, and muscle relaxation.
- Xylazine is the least selective alpha-2 agonist with an alpha-2:1 ratio of 160:1. The drug also binds to imidazoline receptors.
- Depending on administration route, dosage, and combination with other traits, the onset of action for xylazine can be only a few minutes and remain in the body’s system for up to 8+ hours.⁴ Xylazine can cause toxicity and human death at dosages between 40-2400mg.⁴
- Xylazine has a very high volume of distribution d/t elevated lipid solubility and is rapidly concentrated in the CNS and kidneys.⁴ Xylazine is metabolized by cytochrome P450 in the liver and is excreted renally.⁴

- Identify distinguishable symptoms of xylazine side effects and be able to confirm via testing.
- List possible treatment methods to counteract xylazine’s physiological effects.
- Discuss strategies to advance knowledge and awareness of xylazine throughout the medical field.



Xylazine injection: 50mL liquid vial at 100mg/mL. Can be evaporated into powder form.

Clinical Presentation



Oxycodone

Street names include: 30s, M30s, oxy, kickers, 40s, 512s, blues.²



Xanax

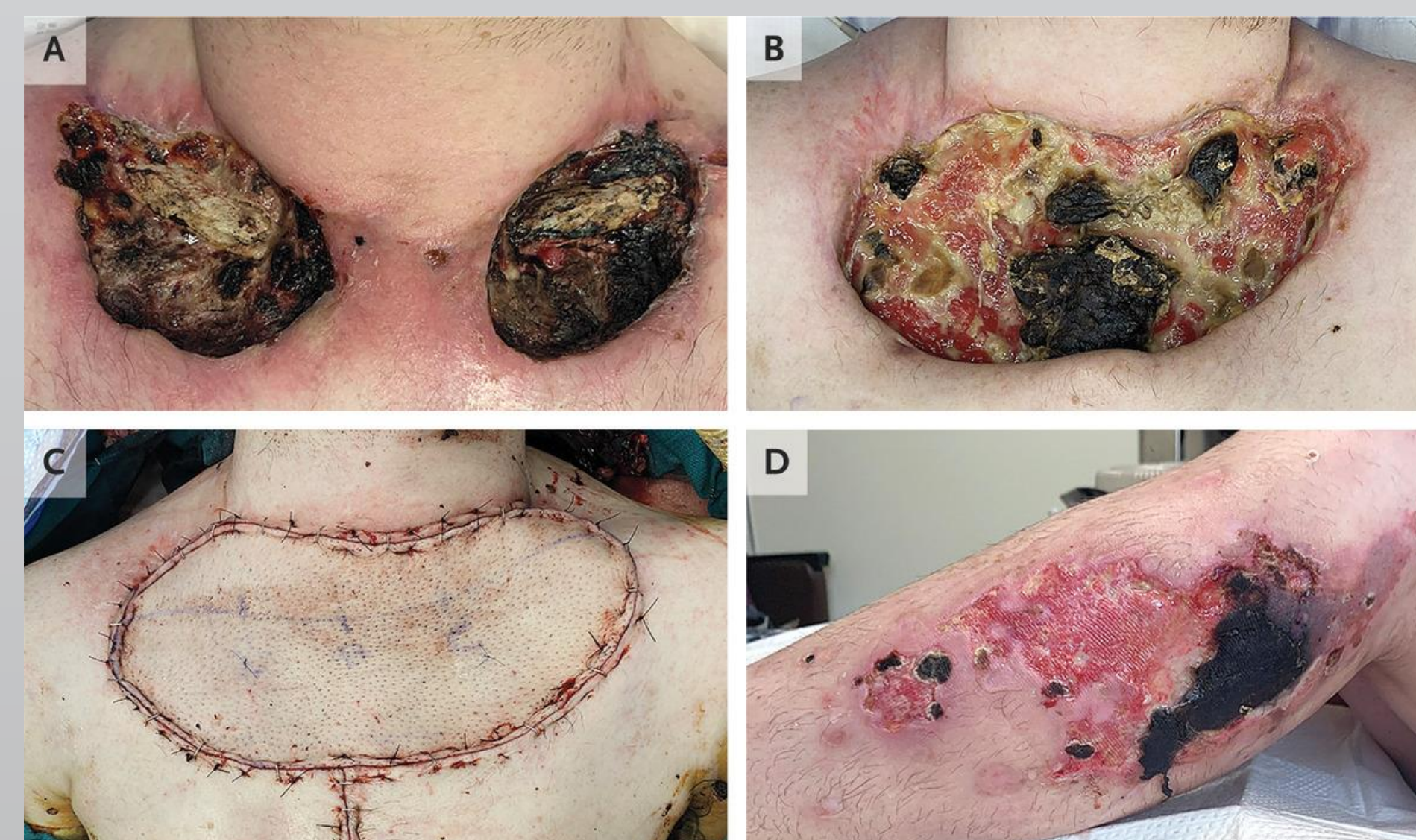
Street names include: bars, benzos, bricks, ladders, sticks, xanies, zanbars, z-bars.²



Amphetamine

Prescribed as: Adderall, Ritalin, Concerta, Dexedrine, Focalin, Metadate, Methylin.²

- While xylazine does not qualify as an opioid, it is delegated as a CNS depressant that causes lethargy, amnesia, respiratory depression, hypotension, and bradycardia.² When combined in addition with opioids, benzodiazepines, or alcohol, the effects can be exacerbated and may lead to a lethal overdose.²
- Patients who have injected substances containing xylazine will likely present with extreme dermal injuries and areas of necrotic tissue that can become septic due to local transient vasoconstriction.² If left untreated, this can be fatal. These visible ulcers can cultivate in bodily regions away from the original drug injection site.²



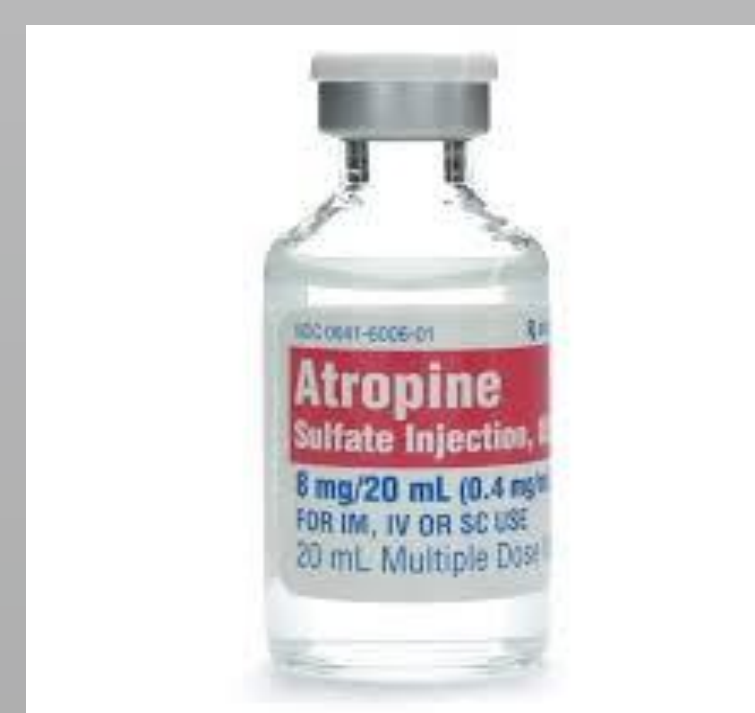
Left: presentation and partial surgical repair of necrosis following xylazine abuse⁵

Right: necrotic tissue of forearm from xylazine misuse⁵



Treatment Options

- In the circumstance of an apparent overdose, it is necessary to dose naloxone because xylazine is frequently taken with narcotics such as fentanyl. However, naloxone will fail to reverse the properties of xylazine because xylazine is a non-opioid drug.
- Xylazine is not usually included in standard toxicology exams. It also may be overlooked in overdose patients and other emergent events like trauma. Consider yohimbine, tolazoline, atipamezole, or gabapentin for supportive care (specifically alpha-2 binders).¹



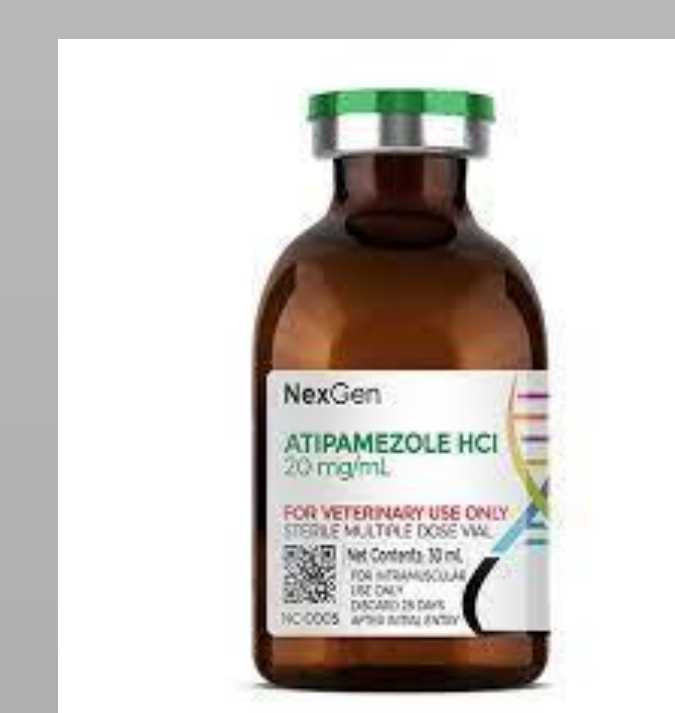
Atropine: opposes xylazine-induced bradycardia and hypotension in various case reports.⁴



Yohimbine: reverses sedative traits of xylazine at 0.125mg/kg.⁴



Tolazoline: given in patients unresponsive to other mediations.⁴



Atipamezole: can be a life-saving agent in overdose crises.⁴

Conclusion

Supportive modalities for xylazine ingestion consist of premedex, supplemental O₂ and airway management, IV fluids, vasopressor use for hemodynamic fluctuation, electrolyte restoration to avoid dysrhythmias, and treatment of hyperglycemia.⁴ Medications that result in CNS depression are contraindicated. Naloxone should be given to address any associated opioid inebriation and consider xylazine if unresponsive. Sustained tranquility is a concern for thromboembolism, and patients should be observed closely.⁴ Hemodialysis is not efficient in eliminating xylazine from the circulatory system due to its high lipid solubility.⁴

Summary: differential of xylazine diagnosis and treatment¹



Future Research

This ultimately provides numerous opportunities for research and follow-up to come. Some forthcoming tasks to be pursued are listed below:

- As of June 2023, no pharmacologic remedy for xylazine intoxication has been sanctioned by the U.S. Food and Drug Administration (FDA).⁴
- There is no current resolution for xylazine withdrawal or continued therapy for xylazine dependence.⁴
- There is no documentation on the impact of xylazine on fetal development and pregnancy for humans.⁴

Acknowledgements/References

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