K6 The Identification of Xylazine in a Patient Who Presented for Heroin Withdrawal

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Learning Overview: The goal of this presentation is to present a recent case of a patient whose toxicology studies revealed the presence of xylazine and to inform the audience about xylazine as a drug adulterant and drug of abuse.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by raising awareness about a less well-known veterinary medicine and providing information about how to detect the drug in human samples.

Introduction: It is important not to overlook veterinary medications as possible drugs of abuse. Having an awareness of these medications is crucial for physicians, forensic pathologists, and toxicologists. Xylazine is a sedative used in veterinary medicine and there are few reports of it being used as a drug of abuse or a drug adulterant in the literature. Detection of xylazine in human samples can be performed by using Gas Chromatography/ Mass Spectrometry (GC/MS).[1] This is a case report of a woman who presented to the emergency department in Royal Oak, MI, for heroin withdrawal, and urine toxicology tests revealed the presence of xylazine.

Case Presentation: A thirty-two-year-old female presented to the emergency department with a chief complaint of nausea, intractable vomiting, and tremors. She has a past medical history of Intravenous (IV) drug abuse, alcohol abuse, anxiety, depression, and hepatitis C. Physical exam findings revealed that the patient had tachycardia (heart rate=139bpm) and multiple skin lesions and scars on the upper and lower extremities. A complete blood count revealed that the patient was anemic (hemoglobin=11.8g/dL) and had neutrophilia with a left shift (neutrophils=14.9bil/L). A comprehensive metabolic panel showed an elevated blood glucose (134mg/dL) and an elevated aspartate aminotransferase (45U/L). During the patient interview, she stated that she used heroin the night before she came to the hospital. The patient was admitted to the hospital for heroin withdrawal and was started on IV fluids and antiemetics.

A comprehensive drug analysis was performed and the patient's urine was positive for codeine, morphine, hydromorphone, and 6-acetylmorphine. GC/MS was performed on the urine, which revealed a lidocaine metabolite, nicotine and metabolites, diphenhydramine, xylazine, ondansetron, fentanyl, and acetyl-fentanyl. The patient ultimately left against medical advice two days after coming to the hospital.

Discussion: Xylazine is an alpha-2 adrenergic agonist and is used as a sedative, muscle relaxant, and analgesic in veterinary medicine. It is administered to animals intravenously, intramuscularly, and subcutaneously. It has been reported that xylazine has been used on its own as a drug of abuse and as an adulterant for heroin. This medication has also been reported to be used as an adulterant with speedball (a mixture of heroin and cocaine).[2] A study published in *Forensic Science International* in 2014 reviewed the literature and found 43 cases of xylazine intoxication. Out of those 43 cases, 22 of them were fatal.[1]

When xylazine is used alone as a drug of abuse, the main route of administration is injection. However, there have been reports of xylazine being inhaled or taken orally. The physical exam findings for a patient who has overdosed on xylazine include lethargy, miosis, hypotonia, respiratory depression, and hypothermia. The clinical presentation of a patient who has overdosed on xylazine will look similar to a clonidine or opioid overdose. For patients who are intoxicated with xylazine, the treatment plan is supportive. Health care providers need to be aware of the need for endotracheal intubation for respiratory depression.[3] Analytical techniques to identify and quantify xylazine in human samples include GC/MS and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS).[1] It's important to note that standard hospital drug screens will not detect the presence of xylazine, like most other Novel Psychoactive Substances (NPSs). The approach that this health system has adopted is designed to be able to confirm the ingestion of NPSs in patients that are still in the emergency room. This has allowed the physicians to attribute certain presenting signs and symptoms to NPSs and treat the patients more appropriately, as well as adding important information regarding local drug surveillance data.

Reference(s):

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2. Reyes J.C., Negron J.L., Colon H.M., Padilla Am, Millan M.Y., Matos T.D., Robles R.R. The emerging of xylazine as a new drug of abuse and its health consequences among drug users in Puerto Rico. *Bull N Y Acad Med*. 2012; 89: 519-526.
3. Capraro A.J., Wiley J.F., Tukcer J.R. Severe intoxication from xylazine inhalation. *Pediatr Emerg Care* 2001; 17(6): 447-448.

Xylazine, Adulterant, Heroin