Emergency Department Drug Surveillance (EDDS) System:
Summary of Initial Findings for Xylazine

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CESAR: Center for Substance Use, Addiction & Health Research

EDDS Overview

The Emergency Department Drug Surveillance system (EDDS) currently operates in 50 hospitals across the U.S., including 30 hospitals participating in National EDDS and 20 participating in Maryland EDDS (MD-EDDS). National EDDS collects two types of data from each participating hospital: 1) a limited data set from patients' electronic health records (EHRs), containing patient drug test results, demographic and clinical information and 2) up to 150 deidentified urine specimens submitted by each hospital from patients treated in their emergency departments that EDDS sends to its collaborating laboratory to be retested for more than 500 drugs. The expanded retesting by EDDS helps hospitals to identify drugs not included in their more limited drug screens and may enhance their treatment practices and their ability to track emerging drugs. This report presents initial findings about xylazine obtained from the 13 hospitals where EDDS tested for the drug.

The one-time sample of 150 urine specimens provided by each hospital typically within a 2-3-month period consisted of 100 consecutive specimens that the hospital found positive for any drug on their screen and 50 specimens that tested negative for all drugs. Because of the growing interest in monitoring xylazine, the EDDS collaborating laboratory added xylazine to their testing panel in September 2022. The specimens came from 13 hospitals in 8 states.

Results

Xylazine was detected in 33 specimens from 8 of the hospitals. All of these states were located in the South (FL, GA, MD, SC, TN). No xylazine was detected in the specimens tested from the 5 other hospitals in Florida, Texas, Nevada, and California. Table 1 shows the percentage of specimens positive for xylazine, according to whether the specimen had tested positive for any drug in the hospitals' limited screens. Most (85%) of the 33 xylazine positive specimens came from the hospital positive specimens. The percentage of hospital positive specimens testing positive for xylazine ranged from 0% to 8%. Hospital negative specimens from four of these hospitals contained no xylazine, while two had 2% and two had 4% positives. Of note is that at TriStar Skyline Medical Center in Nashville, Tennessee, the percentage of xylazine positives was almost the same in their hospital positive (5%) and negative (4%) specimens. The percentage of xylazine positives in Memorial Satilla Health was low and the same (2%) in both groups of specimens.

The average age of the patients who submitted the 33 xylazine positive specimens was 36.6 years, with a range of 18-57 years. The median age was 34. More than one half (52%) came from males. Table 2 shows some of the more common drugs which the EDDS retesting found in these 33 specimens. The drug most likely to be found in addition to xylazine was fentanyl, detected in 85% of the specimens. Cocaine and THC were also detected in more than half of the xylazine positive specimens. Amphetamines and morphine were each detected in 49%. Almost all (91%) tested positive for more than one of these other drugs and 30% had 4 or more of these drugs in their specimens along with xylazine.

Discussion

Although we had limited geographic coverage with the participating hospitals, the fact that xylazine was found solely in hospitals in the Southern states is consistent with findings presented in DEA's *NFLIS-Drug 2021 Annual Report* and *2022 Midyear Report*. In the first half of 2022, the highest numbers and percentages for xylazine were in the Northeastern and Southern United States (Southern: 1,914, 0.84%; Northeast: 1,614, 1.54%) (USDOJ, DEA, 2023).

Our finding that most xylazine positives were found in the specimens that the hospitals indicated had tested positive for a drug in their routine screens is consistent with prior EDDS retesting regarding polydrug use. It has been reported that xylazine is often added to illicit opioids like fentanyl or used in combination with fentanyl to lengthen its effects (Friedman et al., 2022; NIDA, 2023; Thangada et al., 2021). This may explain why so many of the xylazine positive specimens also contained fentanyl. Moreover, most of our specimens came from emergency department patients who tested positive for a drug in the hospital's screens, and it is therefore not surprising that their specimens contained multiple other drugs in addition to xylazine.

EDDS' capability of testing submitted specimens for xylazine presents a unique opportunity to further understand and monitor xylazine exposure among hospital ED patients. In the coming year, CESAR plans to expand testing for xylazine. Results of this testing will be described in future reports.

Acknowledgement

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References

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Table 1: EDDS Collaborating Laboratory's Test Results for Xylazine using LC/MS/MS, by Hospital's Drug Screen Result

(N=761 hospital positive specimens and 386 hospital negative specimens from 8 hospitals)[a]

	Percentage Positive for Xylazine	
	Hospital Found Positive for any drug	**Hospital Found Negative for all drugs**
Meritus Medical Center, Hagerstown, Maryland	(100) 8%	(50) 2%
Grand Strand Medical Center, Myrtle Beach, South Carolina	(100) 6%	(50) 0%
TriStar Skyline Medical Center, Nashville, Tennessee	(100) 5%	(50) 4%
HCA Florida Orange Park Hospital, Orange Park, Florida	(106) 4%	(50) 0%
Memorial Satilla Health, Waycross, Georgia	(100) 2%	(50) 2%
Trident Medical Center, Charleston, South Carolina	(100) 2%	(50) 0%
HCA Florida Aventura Hospital, North Miami, Florida	(103) 1%	(58) 0%
HCA Florida North Florida Hospital, Gainesville, Florida	(52) 0%	(28) 4%
All Above Hospitals Combined	**(761) 4%**	**(386) 1%**

Note: None of these hospitals routinely test patients for xylazine.

[a]Specimens were selected from consecutive emergency department patients aged 18 years or older that had undergone drug toxicology testing. Sampling targeted 100 hospital positive specimens and 50 hospital negative specimens.

Source: Emergency Department Drug Surveillance (EDDS) system, Center for Substance Use, Addiction & Health Research (CESAR), University of Maryland, College Park, 9/6/2023. https://cesar.umd.edu/landing/EDDS

Table 2: Other Selected Common Drugs Detected by EDDS Retesting in Xylazine Positive Specimens

(N=33 specimens from tested ED patients from 8 hospitals re-tested by EDDS)

Any Fentanyl*	85%
Cocaine	67%
THC	55%
Amphetamine	49%
Morphine	49%

Number of above other drugs detected in xylazine positive specimens:

1	9%	
2	21%	
3	40%	
4	18%	30%
5	12%	
	100%	

Mean number of other drugs detected, of 5: **3.03**

These specimens are from 33 patients with an average age of 36.6 and an age range of 18-57. A little over one half (52%) came from males. The 8 hospitals are in Western Maryland, Northern Florida, Southeast Florida, Georgia, South Carolina, and Tennessee.

*The following fentanyl compounds were detected: 4-ANPP (Despropionyl fentanyl), Acetyl Fentanyl/Acetyl Norfentanyl, Fentanyl/Norfentanyl, and/or ortho-Fluorofentanyl/para-Fluorofentanyl (p-FF).

Emergency Department Drug Surveillance (EDDS), Center for Substance Abuse Research (CESAR), University of Maryland, College Park. https://cesar.umd.edu/landing/EDDS