Occurrence of Opioids in Forensic Casework in the State of Sergipe in Brazil (2019 - 2023)

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INTRODUCTION

Opioids are substances frequently reported in forensic casework. Opioid misuse is a global public health problem and has been on the rise in some countries. In the United States, opioid-related deaths have increased between 2019 and 2021[1]. However, in contrast, opioids have not been historically widely abused in Brazil.

OBJECTIVES

The goal of this study was to review the detection of opioids in forensic cases in the state of Sergipe (located in the Northeast Region), in Brazil.

MATERIALS & METHODS

Data from 1,733 forensic cases received by the Forensic Toxicology Laboratory of the Scientific Police of Sergipe between January of 2019 and August of 2023 were retrospectively reviewed. Non-personally identifiable demographic information (gender, age, and case circumstance) and toxicology results obtained via liquid chromatography-triple quadrupole mass spectrometry were reviewed. This study was reviewed by the Appalachian State University and Sam Houston State University Institutional Review Boards (IRB) and determined to not involve human subjects, not requiring IRB oversight.

RESULTS

Opioids were detected in samples collected from cases classified as follows: motor vehicle accidents, fatal intoxications, non-fatal intoxications, cause of death pending and others. The number of cases in which opioids were detected is presented in **Figure 1**. Opioids routinely analyzed by the laboratory include buprenorphine, meperidine, morphine, hydromorphone, dihydrocodeine, codeine, oxycodone, hydrocodone, fentanyl, norfentanyl, tramadol and methadone. The percentage of cases in which opioids were detected relative to the total number of cases positive for drugs, medicines and pesticides was 5.4% (2019), 14.5% (2020), 8.9% (2021), 14.9% (2022) and 8.2% (up to end of August of 2023).

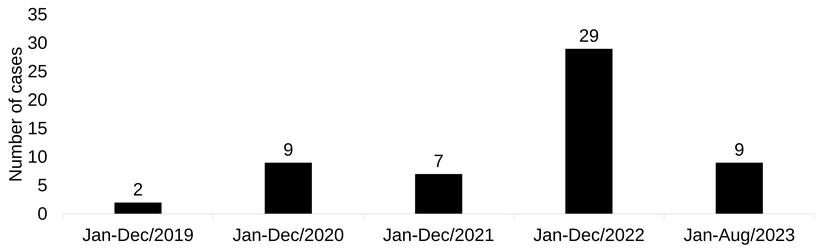

Figure 1. Number of cases in which opioids were detected.

Table 1. Summary of opioid identification in cases received by the Forensic Toxicology Laboratory of the Scientific Police of Sergipe from January of 2019 through August of 2023

		2019	2020	2021	2022	2023
Demographics	Gender	Male: 50% Female: 50%	Male: 67% Female: 33%	Male: 71% Female: 29%	Male: 79% Female: 21%	Male: 56% Female: 44%
	Age	45*	Mean: 31.2 years Median: 34 years	Mean: 31 years* Median: 31.5 years	Mean: 41.4 years Median: 37 years	Mean: 36.4 years Median: 38 years
Toxicological results (opioids detected individually or in the presence of other opioids or classes of drugs)		Fentanyl (n = 1) and tramadol (n = 1)	Fentanyl (n = 4), tramadol (n = 2), morphine (n = 2), acetyl norfentanyl (n = 1), hydromorphone (n = 1) and methadone (n = 1)	Fentanyl (n = 4), morphine (n = 2) and methadone (n = 1)	Fentanyl (n = 21), morphine (n = 4), methadone (n = 4), tramadol (n = 4), codeine (n = 1) and hydromorphone (n = 3)	Fentanyl (n = 7), morphine (n = 1), hydromorphone (n = 1) and methadone (n = 1)

**Data not available for one case*

DISCUSSION AND CONCLUSIONS

- The number of cases involving opioids was low compared to all cases positive for at least one drug, medicine, and pesticides.
- Some cases involving opioids were associated with administration by medical personnel.
- In the first two years of the pandemic (2020 – 2021), the increase in the number of cases positives for opioids (compared to 2019) could also be associated to the administration of fentanyl and midazolam in a hospital setting; the same combination was also observed in cases in 2022 (n = 9) and 2023 (n = 3).
- Although the statistical population is not significant to identify any trends and does not represent the whole country, this data suggests that the prevalence of opioids in forensic casework from 2019 through August of 2023 in the state was limited.
- These findings contrast to data from other countries such as the United States, where opioids were involved in more than 75% of reported deaths by drug overdose in 2022[1], and the European Union, where opioids were reported in 74% of overdose deaths in 2021[2].
- Geographical and cost factors may explain an easier access to other drugs, leading to a lower availability of opioids in the illicit drug supply in Brazil and therefore limited occurrence in casework in the period.
- Nevertheless, the presence of opioids due to legitimate medical use and the emergence of novel synthetic opioids (which may not be under current monitoring) must also be considered when assessing potential/future trends.

ACKNOWLEDGEMENTS

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2. European Union Drugs Agency (EUDA). EU Drug Market: Heroin and other opioids – Key findings and threat assessment. Available from: https://www.euda.europa.eu/publications/eu-drug-markets/heroin-and-other-opioids/key-findings-and-threat-assessment_en.

DISCLOSURE

The authors have no conflicts of interest to disclose.