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ORIGINAL ARTICLE

Observational Study of Xenobiotics in an Urban Hospital, Chennai: Challenges and Outcomes

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ABSTRACT

Background: Poisoning is a significant cause of emergency visits worldwide. This study focuses on clinical presentations, management, and outcomes of acute poisonings in an urban hospital in Chennai.

Aim: To examine trends and challenges in urban poisoning cases.

Objectives: To analyze the profile of poisoning agents, patient demographics, clinical management, and outcomes.

Material and Methods: A retrospective observational study was conducted from May to June 2024 at a tertiary hospital in Chennai. 36 patients were included based on emergency department records.

Results: Most cases (68%) were discharged on request after ED stabilization. Common agents included paracetamol, sedatives, rodenticide, and mosquito repellents. One patient required intubation. Intentional poisoning was predominant (75%).

Conclusion: Urban poisonings often involve household chemicals and pharmaceuticals. Early stabilization improves outcomes, but discharge on request poses a major challenge.

KEYWORDS

• Poisoning • Xenobiotics • Emergency medicine • Urban hospital • Chennai

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INTRODUCTION

Background: Poisoning remains a major cause of morbidity and mortality globally. The agent profile in urban areas often differs significantly from rural settings. While rural India faces agrochemical exposures, urban hospitals see more cases of household and pharmaceutical poisonings.[1,2]

Aim & Objectives

This study aims to explore poisoning patterns, patient demographics, management, and outcomes in an urban emergency department in Chennai.

Hypothesis

Urban poisoning patterns are characterized by pharmaceutical and household chemical exposures and are associated with lower mortality but significant management challenges.

MATERIAL AND METHODS

Study Design: Retrospective observational study conducted over 2 months (May–June 2024).

Inclusion Criteria: All patients presenting to the emergency department with confirmed or suspected poisoning.

Exclusion Criteria: Cases with incomplete records or non-toxicological presentations.

Sample Size: 36 patients (out of 40 screened) with complete data were included.

Data Source: Patient records, including ED case sheets, ICU notes, and toxicology reports.

Ethical Clearance: Approved by the Institutional Ethics Committee. Patient data confidentiality was maintained throughout.

RESULTS

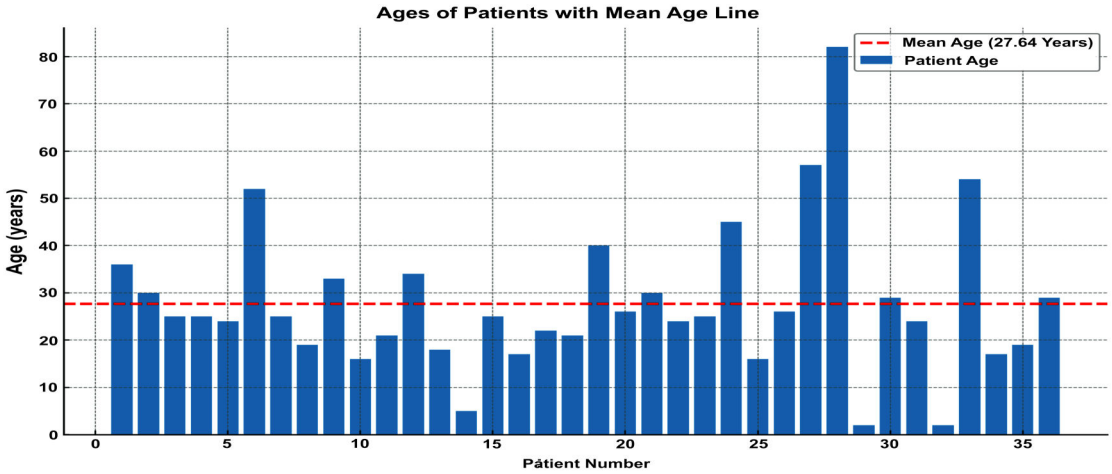


Figure 1: Age wise distribution of patients in our study

In our study age group range was between 82 years and 4 years with a mean age of 27.64 years.

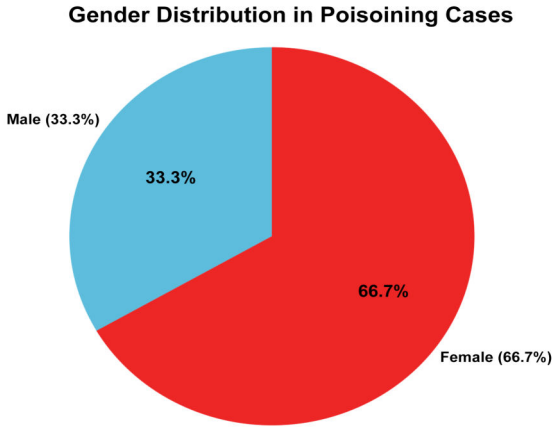


Figure 2: pie chart showing the gender distribution in poisoning cases: Male: 33.3%, Female: 66.7%

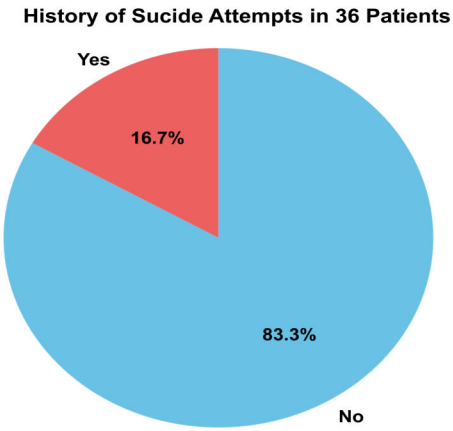


Figure 3: Distribution of patients based on suicidal attempts

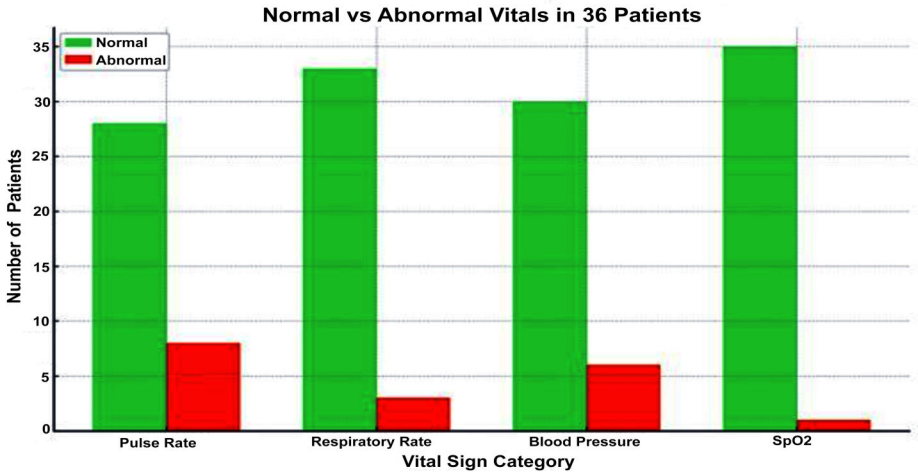


Figure 4: Distribution based on vital signs assessment

The above chart illustrates the distribution of patients with normal and abnormal vital signs across four key physiological parameters: pulse rate, respiratory rate, blood pressure, and oxygen saturation (SpO_2).

Pulse Rate was abnormal in approximately 8 patients, while 28 had normal values.

Respiratory Rate abnormalities were observed in 3 patients, with the remaining 33 being normal.

Blood Pressure was abnormal in about 6 patients, and 30 had normal readings.

SpO_2 levels were abnormal in only 1 patient, while 35 patients had normal oxygen saturation.

These findings indicate that the most frequent abnormality was in pulse rate, followed by blood pressure. SpO_2 was the least commonly affected parameter.

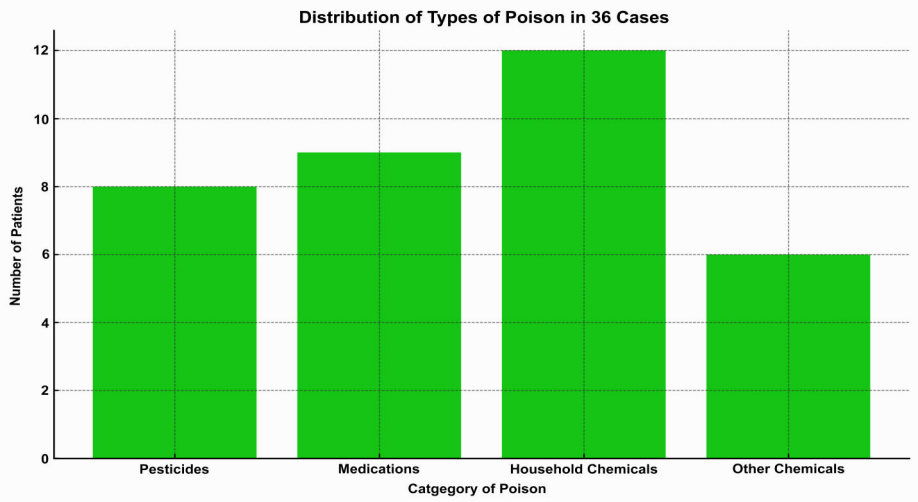


Figure 5: Distribution based on type of poisoning

The bar chart displays the types of poisons encountered in patients presenting with toxic exposures. The data is categorized into pesticides, medications, household chemicals, and other chemicals.

- Household chemicals were the most commonly implicated agents, involved in 12 cases.
- Medications accounted for 9 cases, indicating a significant burden of pharmaceutical poisoning.
- Pesticides were the cause in 8 cases, reflecting continued risk from agricultural or domestic exposure.
- Other chemicals, including industrial agents or unspecified substances, were seen in 6 cases.

These findings highlight the diverse nature of xenobiotic exposures, with a notable predominance of domestic and medication-related poisonings.

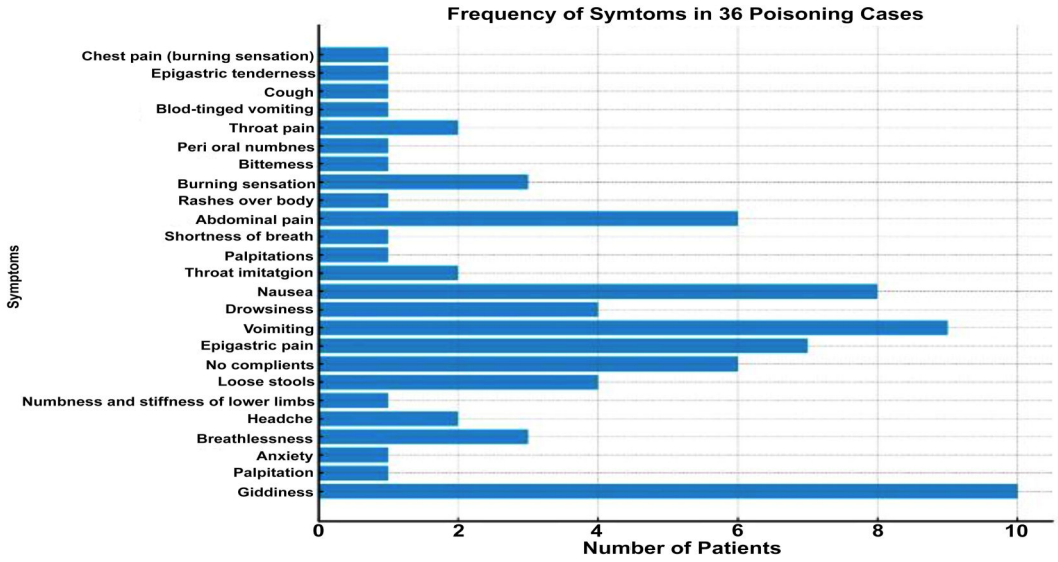


Figure 6: Distribution based on type of symptoms

The horizontal bar chart presents the spectrum and frequency of clinical symptoms observed in patients with xenobiotic exposure.

The most common symptoms were:

- Giddiness (*10 patients*)
- Vomiting (*9 patients*)
- Nausea and epigastric pain (*8 and 7 patients*, respectively)
- Abdominal pain, drowsiness, and no complaints each occurred in 6 patients.
- Other notable symptoms included:

Loose stools and burning sensation (*5 patients* each)

Throat pain, throat irritation, peri-oral numbness, and bitterness were less frequently reported but still clinically relevant.

Less frequent symptoms included anxiety, headache, breathlessness, and numbness of lower limbs, all seen in fewer than 4 patients. A wide range of gastrointestinal and neurological symptoms were noted, reflecting the diverse nature of toxins involved.

These findings emphasize the need for clinicians to consider poisoning in the differential diagnosis of patients presenting with **non-specific but clustered symptoms,** particularly gastrointestinal and neurological complaints.

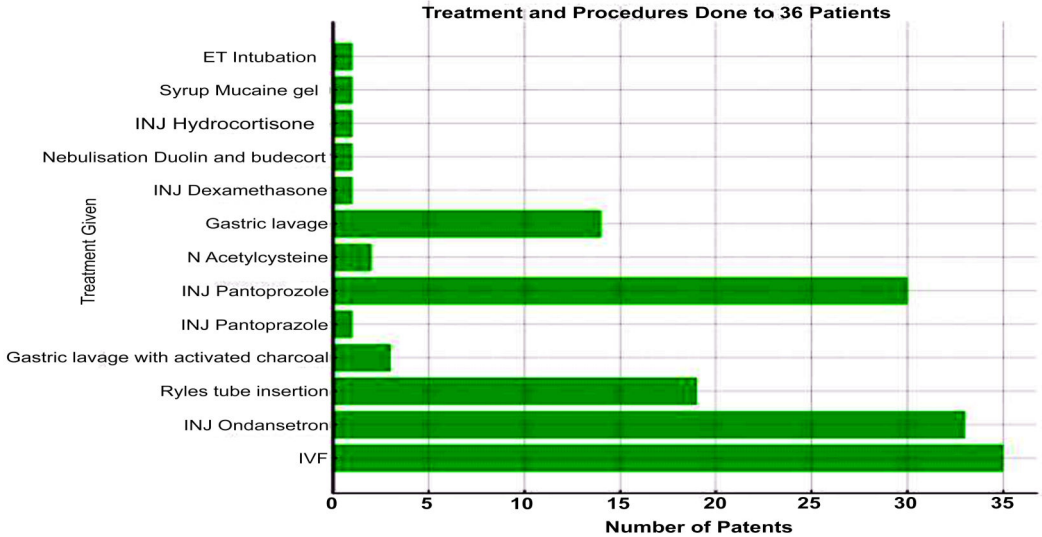


Figure 7: Distribution based on treatment received

The above chart outlines the various therapeutic interventions provided to patients with toxic exposures.

The most commonly administered treatments were:

Intravenous fluids (IVF) – given to **34 p**atients

Injection Ondansetron – used in 32 patients for managing nausea and vomiting

Injection Pantoprazole – administered to 28 patients for gastric protection

Supportive interventions included:

Ryles tube insertion (20 patients) and gastric lavage (14 patients), reflecting the need for decontamination in significant ingestions

Gastric lavage with activated charcoal was used in a limited number of cases (3 patients)

Other treatments:

Injection Dexamethasone and Nebulisation with Duolin/Budecort were given in 6 and 2 cases, respectively, possibly for respiratory involvement or inflammation

Syrup Mucaine gel, Hydrocortisone, and ET Intubation were used very infrequently

N-Acetylcysteine (NAC) was used in 2 patients, suggesting suspected or confirmed paracetamol toxicity.

This distribution highlights a predominant reliance on symptomatic and supportive care, with only a few cases requiring antidotal therapy or airway protection.

68% of patients are discharged on request from the ER after initial stabilization for 6-8 hours.

32% of patients were discharged from the ICU.

ET Intubation:

1 patient required ET intubation for respiratory dist**ress.**

DISCUSSION

Our study reveals that in urban centers like Chennai, poisoning cases are primarily due to accessible household products and medications. These findings are similar to other studies in metropolitan India.[3]

In comparison, Aggarwal *et al*. (2023) observed a predominance of organophosphate poisoning (79.9%) in rural North India with a mortality rate of 16.3%, highlighting the relatively lower lethality of urban exposures.[4]

Despite zero mortality, the high DOR rate (68%) remains a major concern. Patients often cite financial strain, stigma, or lack of awareness as reasons for early departure. This issue is less documented in Western literature, where discharge is typically against medical advice (AMA) and often tracked for follow-up.[2,5]

The study also emphasizes the critical role of early ED stabilization and the need for psychiatric counseling in intentional cases.[6,7]

CONCLUSION

Urban poisonings are primarily caused by household and pharmaceutical agents, with favorable outcomes if early stabilization is provided. However, premature discharge (DOR) remains a critical barrier to effective care.

Conflict of Interest: The authors declare no conflict of interest.

Funding: No funding was received for this study.

Ethics Declaration: Institutional Ethics Committee approval was obtained. Patient identity and data confidentiality were strictly maintained.

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