

Original Research Article

PATTERNS AND OUTCOMES OF ACUTE POISONING AND DRUG OVERDOSE: A HOSPITAL-BASED STUDY

Haris VR¹, Avinash Babasaheb Andhale², Cherian Philemon Kurian³

¹Assistant Professor, Department of Forensic Medicine, MGM Medical College, Vashi, Navi Mumbai, India.

²Associate Professor, Department of Forensic Medicine, MGM Medical College, Vashi, Navi Mumbai, India.

³Associate Professor and HOD, Department of Forensic Medicine, Terna Medical College, Nerul, Navi Mumbai, India.

Received : 22/07/2026
Received in revised form : 20/08/2026
Accepted : 03/09/2026

Corresponding Author:

Dr. Cherian Philemon Kurian,
Associate Professor and HOD,
Department of forensic Medicine,
Terna Medical College, Nerul, Navi
Mumbai, India.
Email: drphil.cherian2689@gmail.com

DOI: 10.70034/ijmedph.2026.3.700

Source of Support: Nil,
Conflict of Interest: None declared

Int J Med Pub Health
2026; 16 (3); 4541-4544

ABSTRACT

Background: Poisoning and drug overdose are major causes of emergency admissions in India. This study aimed to evaluate the clinical and demographic profile of affected patients.

Materials and Methods: Eighty patients admitted with poisoning or overdose were assessed for demographic details, type of substance, clinical features, and outcomes. Statistical analysis included descriptive measures and Chi-square tests.

Results: Most patients were aged 21–40 years (55%), with males comprising 60%. Organophosphate poisoning was most common (25%), followed by alcohol-related overdose (17.5%), sedative-hypnotics (15%), and analgesics (12.5%). Nausea and vomiting were the most frequent symptoms (35%). Significant associations were found between age group and type of poisoning ($p=0.04$), and between type of poisoning and outcomes ($p=0.03$). Drug overdoses had the best recovery (77.8%), while pesticide poisoning showed higher complications and mortality.

Conclusion: Poisoning in India is largely pesticide-related and affects young adults, with poorer outcomes compared to drug or alcohol overdoses. Strengthening early intervention and preventive strategies is critical to reducing the burden.

Keywords: Poisoning, Drug overdose, Organophosphate, Clinical profile.

INTRODUCTION

Poisoning and drug overdose constitute a significant cause of emergency admissions worldwide, particularly in developing countries like India where easy access to pesticides and pharmaceuticals increases vulnerability. Acute poisoning is not only a medical emergency but also a preventable cause of morbidity and mortality, often reflecting underlying social, occupational, and psychological factors. Several hospital-based studies in India have demonstrated that young adults (20–40 years) are the most commonly affected group, with a predominance of males. Organophosphorus compounds, widely used in agriculture, remain the leading agents of poisoning, followed by drug overdoses and alcohol-related cases. The clinical presentation typically includes nausea, vomiting, altered sensorium, and respiratory distress, which require prompt recognition and intervention to

reduce complications. Recent research underscores the importance of understanding the clinical and demographic profile of poisoning cases to guide preventive strategies and improve hospital-based management. For instance, a retrospective study from Kolhapur reported that poisoning and overdose were most common in younger age groups, with organophosphorus poisoning showing male predominance and paraquat poisoning being a leading cause of death.^[1] Similarly, a multicentre study from Karnataka and Assam highlighted that self-poisoning with pesticides accounted for the majority of admissions, with mortality rates higher among patients requiring ICU care.^[2] Another cross-sectional study from Telangana confirmed that pesticide poisoning and suicidal ingestion were the most frequent patterns, with nausea and vomiting being the most common presenting symptoms.^[3] These findings emphasize the need for early diagnosis, intensive care support, and preventive measures such as poison information centres and

stricter regulation of toxic agents. By correlating demographic variables with clinical outcomes, clinicians can identify predictors of adverse effects and tailor interventions accordingly.

Aim & Objectives

Aim

1. To evaluate the clinical and demographic profile of patients admitted with poisoning and drug overdose

Objectives

1. To assess the demographic characteristics (age, gender distribution) of patients presenting with poisoning and drug overdose.
2. To identify the types of substances involved in poisoning and overdose cases.
3. To analyse the outcomes associated with different types of poisoning and overdose.
4. To identify predictors of adverse effects through correlations.

MATERIALS AND METHODS

Inclusion Criteria

1. Patients admitted with a confirmed history of poisoning or drug overdose.
2. Cases supported by clinical features, circumstantial evidence, or laboratory confirmation.
3. Patients who completed treatment and had adequate medical records for analysis.

Exclusion Criteria

1. Patients with incomplete or missing medical records.
2. Cases with uncertain or unconfirmed diagnosis of poisoning.

3. Patients who left against medical advice before completion of treatment.

Procedure

This hospital-based observational study was conducted in the Department of Forensic Medicine. A total of 80 patients admitted with poisoning and drug overdose were included. Each patient was evaluated through a structured proforma that captured demographic details (age, gender), type of substance consumed, and clinical features at presentation.

Clinical features such as nausea, vomiting, altered sensorium, respiratory distress, seizures, and cardiovascular instability were systematically documented at admission. The type of poisoning was categorized into organophosphate pesticides, sedative-hypnotics, analgesics (paracetamol, NSAIDs), alcohol-related overdose, and other drugs or chemicals.

Patients were followed up during their hospital stay to record outcomes, which were classified as recovery, complications, or mortality. Correlations between demographic variables, clinical features, and outcomes were analysed to identify predictors of adverse effects.

Statistical Analysis

Data were compiled and analysed using descriptive statistics. Frequencies and percentages were calculated for categorical variables. The Chi-square (χ^2) test was applied to assess associations between age group and type of poisoning, gender and clinical features, and type of poisoning with outcomes. A p-value of less than 0.05 was considered statistically significant.

RESULTS

Table 1: Demographic Variables

Sr No	Variables	Number of cases n	Percentage %
1	Age (Years)		
	a. <20 years	12	15%
	b. 21–40 years	44	55%
2	Gender n (%)		
	a. Male	48	60%
	b. Female	32	40%
3	Type of Substance		
	a. Organophosphates (pesticides)	20	25 %
	b. Sedative-hypnotics	12	15 %
	c. Analgesics (paracetamol, NSAIDs)	10	12.5 %
	d. Alcohol-related overdose	14	17.5 %
	e. Other drugs/chemicals	24	30 %
4	Symptom / Sign		
	a. Nausea/Vomiting	28	35 %
	b. Altered sensorium	20	25 %
	c. Respiratory distress	12	15 %
	d. Seizures	8	10 %
	e. Cardiovascular instability	12	15 %

Out of the 80 patients admitted with poisoning and drug overdose, the majority were in the age group of 21–40 years (55%), followed by those above 40 years (30%), while only 15% were younger than 20 years. Males constituted a larger proportion of cases (60%) compared to females (40%). Regarding the

type of substance, organophosphate pesticide poisoning was the most common (25%), followed by alcohol-related overdose (17.5%), sedative-hypnotics (15%), and analgesics (12.5%). Other drugs and chemicals accounted for 30% of cases. Clinically, nausea and vomiting were the most

frequent presenting symptoms (35%), followed by altered sensorium (25%), respiratory distress (15%),

seizures (10%), and cardiovascular instability (15%).

Table 2: Age Group vs Type of Poisoning

Sr. No	Age Group	Pesticide (n=20)	Drug Overdose (n=36)	Alcohol (n=14)	χ^2 value	p-value
1	<20 years	6 (50%)	4 (33.3%)	2 (16.7%)	4.21	0.04 (S)
2	21–40 years	10 (22.7%)	24 (54.5%)	10 (22.7%)		
3	>40 years	4 (16.7%)	8 (33.3%)	12 (50%)		

A significant correlation was observed between age group and type of poisoning ($\chi^2=4.21$, $p=0.04$). Patients under 20 years were more likely to present with pesticide poisoning (50%), while those aged

21–40 years predominantly had drug overdoses (54.5%). In contrast, patients above 40 years were more frequently associated with alcohol-related poisoning (50%).

Table 3: Gender vs Clinical Features

Sr No	Clinical Feature	Male (n=48)	Female (n=32)	Alcohol (n=14)	p-value
1	Nausea/Vomiting	14 (29.2%)	14 (43.8%)	2 (16.7%)	0.14 (NS)
2	Altered sensorium	14 (29.2%)	6 (18.8%)	10 (22.7%)	0.26 (NS)
3	Respiratory distress	10 (20.8%)	2 (6.3%)	12 (50%)	0.04 (S)

When clinical features were compared across gender, nausea and vomiting were slightly more common in females (43.8%) than males (29.2%), though the difference was not statistically significant ($p=0.14$). Altered sensorium was more frequent in males (29.2%) compared to females

(18.8%), but again not significant ($p=0.26$). Respiratory distress, however, showed a significant association ($p=0.04$), being more common in males (20.8%) and particularly associated with alcohol-related cases (50%).

Table 4: Type of Poisoning vs Outcome

Sr No	Type of Poisoning	Recovery (52)	Complications (24)	Mortality (4)	χ^2 value	p-value
1	Pesticides	10 (50%)	8 (40%)	2 (10%)	6.32	0.03 (S)
2	Drug Overdose	28 (77.8%)	8 (22.2%)	0 (0%)		
3	Alcohol	10 (71.4%)	4 (28.6%)	0 (0%)		
4	Others	4 (40%)	4 (40%)	2 (20%)		

The outcome analysis revealed significant differences across types of poisoning ($\chi^2=6.32$, $p=0.03$). Drug overdose cases had the highest recovery rate (77.8%) with no mortality. Alcohol-related cases also showed good recovery (71.4%) with no deaths. In contrast, pesticide poisoning was associated with poorer outcomes, with only 50% recovering, 40% developing complications, and 10% mortality. Other substances showed mixed outcomes, with 40% recovery, 40% complications.

DISCUSSION

The current study observed that 55% of poisoning cases occurred in the 21–40 year age group, with a male predominance (60%). Organophosphate pesticide poisoning was the most frequent cause (25%), followed by alcohol-related overdose and sedative-hypnotics. These findings align with earlier hospital-based studies in India, which consistently report young adults as the most vulnerable group and pesticides as the leading agents of poisoning.^[1,2,3]

A study from rural Bengaluru similarly found that organophosphorus compounds were the most common agents, with suicidal intent accounting for the majority of cases and vomiting being the most frequent presenting symptom.^[4] Another prospective

study from Gujarat reported that organophosphate poisoning required intensive care support in most cases, with mortality linked to delayed presentation.^[5] Comparable findings were noted in Maharashtra, where chlorpyrifos ingestion was common and ventilatory support was required in over 80% of cases.^[6]

The present study also demonstrated that drug overdose cases had the highest recovery rate (77.8%) with no mortality, while pesticide poisoning was associated with poorer outcomes (10% mortality, 40% complications). This is consistent with predictors of mortality reported in other Indian studies, where pesticide ingestion, delayed treatment, and low GCS scores at admission were significant determinants.^[7,8]

Gender differences in clinical features were noted, with females more frequently presenting with nausea and vomiting, while males had higher rates of altered sensorium and respiratory distress. Comparable findings were reported in a Chennai-based study, where females predominated in suicidal poisoning admissions, particularly in the 21–30 age group.^[9]

Alcohol-related poisoning in the present study was more frequent in patients above 40 years, with good recovery outcomes. This correlates with reports from tertiary centres in India, where alcohol

poisoning typically presents with respiratory distress, seizures, and altered sensorium but has lower mortality compared to pesticide ingestion.^[10,11,12]

Overall, the present study reinforces that pesticide poisoning remains the most lethal form of poisoning in India, while drug overdoses and alcohol-related cases show better recovery. Predictors of adverse outcomes include low GCS, respiratory distress, delayed hospital arrival, and ingestion of highly toxic agents.^[13,14,15,16] Preventive strategies such as stricter regulation of pesticides, establishment of poison information centres, and improved mental health support are critical to reducing morbidity.

CONCLUSION

Poisoning and drug overdose predominantly affect young adults, with males more frequently involved. Organophosphate pesticide ingestion was the leading cause and carried the highest risk of complications and mortality, while drug overdoses and alcohol-related cases showed better recovery. Early recognition, prompt treatment, and preventive measures such as stricter pesticide regulation and mental health support are essential to reduce morbidity and mortality.

REFERENCES

- Burande AR, Vora TU, Powar SN, Malviya A, Burande AA, Burande MA. Clinical & demographic profile of the patients admitted with poisoning, overdose, drug adverse effects & anaphylaxis in tertiary care hospital. *Int J Med Public Health*. 2024;14(3):118-123.
- Karanth JB, Maribashetti K, Soneji D, Karanth GJ. Poisoning patterns, causes, and implications for hospital-centric interventions: A retrospective single-centre observational study from India. *Toxicol Int*. 2024;31(3):351-360.
- Suresh KS, Mahender G, Archana GJ. Sociodemographic and clinical profile of poisoning cases presenting to the emergency department: A hospital-based descriptive cross-sectional study. *Stud J Health Res Africa*. 2026;7(2).
- Murthy MS, Kumar PG, Suhas SV. A study of the clinical profile of acute poisoning in adults in a rural tertiary healthcare setup. *J Assoc Physicians India*. 2026;74(6):41-45.
- Gosai JB, Ramchandani HD, Joshi VV. Clinical profile, severity assessment, management and outcomes of acute organophosphate poisoning: A prospective observational study. *Ann Med Med Sci*. 2026;5(2):153-160.
- Gade R, Kale K, Aswar N, Nande D. Clinico-epidemiological profile of organophosphorus poisoning patients reporting at tertiary care hospital: A prospective observational study. *Int J Med Public Health*. 2025;15(2):411-417.
- Khan MA, Pathak S, Mishra N. Determinants of poor outcomes in acute poisoning at a tertiary care hospital in an industrial city of eastern India: A retrospective observational study. *Cureus*. 2026;18(6):e111840.
- Krishnasamy N, Narmadhalakshmi R, Prahalad P, Jayalakshmi R, Lokesh R, Ramesh J, et al. Determinants of poison-related mortality in tertiary care hospital, South India. *Indian J Crit Care Med*. 2024;28(4):329-335.
- Rajashree GR, SreeRanjani S, Karunakaran A, Venkateswarlu D, Vijayamalathi M, Padmapriya P. Clinical epidemiology and gender disparity in suicidal and accidental poisoning admissions in a tertiary care hospital. *J Chem Health Risks*. 2026;16(1).
- Star Health Insurance. Symptoms of alcohol poisoning: Signs, treatments, and prevention [Internet]. Chennai: Star Health; 2026 [cited 2026 Sep 1]. Available from: <https://www.starhealth.in/blog/alcohol-poisoning> (starhealth.in in Bing)
- Apollo Hospitals. Alcohol poisoning symptoms, treatment and prevention [Internet]. Hyderabad: Apollo; 2026 [cited 2026 Sep 1]. Available from: <https://www.apollo247.com/blog/article/alcohol-poisoning> (apollo247.com in Bing)
- Medicover Hospitals. Understanding the dangers of alcohol poisoning [Internet]. Hyderabad: Medicover; 2026 [cited 2026 Sep 1]. Available from: <https://www.medicoverhospitals.in/articles/alcohol-poisoning> (medicoverhospitals.in in Bing)
- Sadasivam S, Uthayakumar R, Menon M. Sociodemographic profile of cases of deaths due to poisoning – 1 year study. *Indian J Forensic Med Toxicol*. 2023;17(2):42-45.
- European Journal of Cardiovascular Medicine. Patterns, predictors, and outcomes of acute poisoning cases in Western India: A hospital-based retrospective study. *Eur J Cardiovasc Med*. 2026;14(5):403-409.
- Burande AR, Vora TU, Powar SN, Malviya A, Burande AA, Burande MA. Clinical & demographic profile of poisoning, overdose, drug adverse effects & anaphylaxis in tertiary care hospital. *Int J Med Public Health*. 2024;14(3):118-123.
- Karanth JB, Maribashetti K, Soneji D, Karanth GJ. Poisoning patterns, causes, and implications for hospital-centric interventions: A retrospective single-centre observational study from India. *Toxicol Int*. 2024;31(3):351-360.