

A Study on Clinical Patterns and Outcomes of Acute Poisoning at a Tertiary Care Hospital

Namana G¹, Sekhar Sharma¹, Raman Dang², Rakshitha NP^{1,*}

¹Department of Pharmacy Practice, Krupanidhi College of Pharmacy, Krupanidhi College of Pharmacy, Carmellaram, Bangalore, Karnataka, INDIA.

²Krupanidhi College of Pharmacy, Carmellaram, Bangalore, Karnataka, INDIA.

ABSTRACT

Background: Acute poisoning is a major global public health concern. Intentional and accidental exposure of a harmful substance. Depending on socioeconomic factors and accessibility of toxic substances, poisoning patterns frequently differ between areas. While drug overdose and household chemicals are more common in urban settings, agriculture pesticide is often involved in rural areas. This study facilitates the development of successful prevention strategies and enhances early treatments. **Materials and Methods:** The cross sectional and observational study were done among 52 patients over a period of 6 months at emergency department and toxicological unit at tertiary care hospital. Informed consent and ethical clearance were obtained. It was predetermined based on inclusion and exclusion criteria. Medical records were used to gather the information and results were analysed statistically. **Results:** The majority of the patients among 52 cases of acute poisoning were female housewives between the ages of 25-50. The most frequent cause was intentional self-poisoning, which was primarily bought on by drug overdose and organophosphates. The most common symptom was nausea and vomiting, most of the patient had arrived early to the hospital, were treated quickly and were haemodynamically stable. **Conclusion:** The main cause of acute poisoning, which often affects young adults in rural areas, is intentional self-harm. Timely treatment and early hospital admission significantly reduce morbidity and mortality. Rising community awareness, limiting access to pesticides, providing timely mental health support, and establishing poison information centre will help to reduce the self-harm.

Keywords: Acute poisoning, Drug overdose, Organophosphates, Toxicology, Poison.

Correspondence:

Ms. Rakshitha NP

Intern, Department of Pharmacy
practise, Krupanidhi college of Pharmacy,
Krupanidhi College of Pharmacy,
Carmellaram, Bangalore-560035,
Karnataka, INDIA.
Email: rakshitha2559@gmail.com

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INTRODUCTION

Acute poisoning is one of the common medical emergencies and a public health problem worldwide.^{1,2} Toxicity occurs when a toxic substance enters the body in a sufficient quantity that causes harmful effects to the normal body physiology.³ Exposure to this toxic agent may occur through ingestion, inhalation, injection, or skin contact. This toxic substance may show a wide range of clinical manifestations, such as respiratory failure, cardiovascular collapse, and organ failure, and may even cause death because of its potential and life-threatening effects.⁴ Acute poisoning requires immediate medical attention and clinical management.⁵

In India, acute poisoning shows a major cause of morbidity and mortality, particularly in young adults and individuals in

rural areas.⁶ Agriculture pesticides such as organophosphates and carbamates are the most reported poisonings due to their widespread use in agriculture.⁷ Poisoning may also occur due to drug overdose, corrosive substances, cleaning product and kerosene ingestion, snake bites, or insect stings. Poisoning may occur both intentionally and accidentally. Intentional poisoning is often associated with suicide attempts, whereas accidental poisoning occurs when an individual is exposed to toxic substances during occupational activities.^{8,9}

The clinical presentation of poisoning depends upon the nature of the toxic agent, the dose consumed, and the time elapsed before medical intervention. The patient may complain about symptoms like nausea, vomiting, abdominal pain, hyper salivation, and altered consciousness. Severe poisoning cases show symptoms that affect the neurological symptoms like seizures, coma, respiratory failure, hypotension, and organ failure and may even show death. The management of this acute poisoning involves rapid clinical assessment, vital stability, and decontamination of the poison and most importantly assessing Airway, breathing and Circulation. Antidote-specific treatment also happens if the exact



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toxic agent is known; the treatment of various types of poisoning is basically symptom-based treatment.^{10,11}

Understanding the clinical patterns, type of toxic agent, and treatment of the poisoning cases is essential for improving the patient care and developing preventive strategies. Although there are studies that have reported the incidence of the poisoning in different regions, the clinical outcome, type of toxic agent involved, and outcome of the treatment vary significantly depending on the geographical location and socioeconomic condition. In many regions there is limited hospital-based data describing the details of the acute poisoning. A hospital-based study is also essential to identify the common poisoning agent, its clinical manifestation, and its outcome in a particular region. Therefore, the present study was undertaken to evaluate the clinical pattern and outcome of acute poisoning cases admitted to a tertiary care hospital.

MATERIALS AND METHODS

Study Design

Cross sectional, observational study.

Study Setting

Emergency Department and Toxicological Unit at tertiary care hospital, India.

Study Population and Sampling

The study population comprised 52 patients in the emergency and toxicological unit diagnosed with acute poisoning over a defined period from February 2025 to August 2025. Patient of age above 18 years and presenting with acute poisoning who met the inclusion criteria was included in the study.

Human ethical clearance

Human ethical clearance was obtained from the Institutional Ethics Committee of MVJ and Research Hospital for carrying out the research work with Ethical Clearance Number [REF: MVJMC&RH/IEC-06/2025]. Participants were informed about the objectives of the study, and their participation was entirely voluntary. Confidentiality was maintained throughout the study by excluding personal identifiers from the study records. The collected data were used solely for research purposes and were accessible only to the study investigators.

Inclusion Criteria

- Patients aged 18 years and above.
- Patients presenting with acute poisoning to the emergency department unit during the study period of February 2025 to August 2025.
- Patients providing informed written consent.

Exclusion Criteria

- Patients unable or unwilling to participate.
- Patients with incomplete, inconsistent responses or insufficient data of extraction.
- Patients with cognitive impairments or language barriers that hinder communication.
- Patient with chronic poisoning.

Data Collection Instrument

Data collection was carried out by the investigators themselves using the structured case sheet and the direct patient interview. All the interviews and data recording were conducted in the presence of a qualified toxicologist to ensure clinical accuracy; valid patient reported symptoms and assist in identifying poison related complications when necessary. This approach ensures data reliability and minimized diagnostic bias. Patients were approached during their admission in emergency. After providing detailed information about the study, informed consent was obtained.

Data Analysis

Data were compiled in Microsoft excel and analysed using descriptive statistics. Frequencies and percentages were used to summarise categorical variables. Associations between categorical variables were assessed using the Chi-square test or Fisher's exact test where appropriate. A p -value <0.05 was considered statistically significant. Tables and chart were used to represent the distribution.

RESULTS

The research comprised 52 individuals who had acute poisoning. Table 1A displays the study population's demographic features. The majority of patients were between the ages of 25 and 50, with a somewhat larger percentage of cases being female. Among the research participants, housewives made up the biggest occupational category. Additional demographic variable including the median age, mean age, marital status education status has also been incorporated in Tables 1B, 2 and Figure 1 outline the kind and method of poisoning that was seen in the patients. The most common method of exposure was intentional poisoning. The most common poisonous agent was drug or pill overdose (Paracetamol, Benzodiazepines, NSAIDs) which was followed by organophosphate chemicals and other poisoning agents.

Table 3 and Figure 2 show the clinical signs and the duration between exposure to poisoning and hospitalization. Vomiting was the most common presenting complaint, and gastrointestinal problems were the most often reported clinical characteristics. The majority of victims arrived at the hospital in the first few hours

after being poisoned Table 4 and Figure 3 provides an overview of the patients' clinical results and therapy approaches. The mainstay of management was supportive care, which included intravenous fluids and symptomatic drugs. A lesser percentage of patients left the hospital against medical recommendation, but the majority reached clinical stability and were released after recovering.

Table 5 shows that no significant association between gender and manner of poisoning ($\chi^2=0.614$, $p=0.433$). Table 6 shows Inferential statistical analyses to explore associations between selected demographic and clinical variables. No statistically significant association was observed between age group and clinical outcome ($p=0.813$), gender and clinical outcome ($p=0.196$), gender and manner of poisoning ($p=0.433$), time to hospital presentation and clinical outcome ($p=1.000$), or poisoning agent category and clinical outcome ($p>0.05$)

DISCUSSION

Acute poisoning remains one of the important causes of morbidity and emergency hospital admission, especially in countries where toxic substances are easily accessible. The present study is done to evaluate the clinical profile, toxic agent involved, management practice, and outcome of the acute poisoning case admitted to a tertiary care hospital. The finding of the study shows an epidemiological characteristic and the clinical patterns in the region and highlights the factors that influence the patient outcome.

This study evaluated the clinical profile, toxic agent used, management strategies, and outcome of acute poisoning admitted to the tertiary care hospital. The findings suggested that poisoning was frequent in young adults, with intentional exposure being the predominant mode of poisoning. Drug overdose and organophosphate poisoning were the common toxic agents. Early hospital presentation and timely supportive management contribute to favourable clinical outcome in most of the patient

The poisoning among the young adults in the present study is consistent with findings from several epidemiological studies. Previous studies have shown that poisoning frequently occurs in young adults due to increased psychological stress and accessibility to toxic substances.¹² Similarly, the predominance of intentional poisoning also aligns with findings from several studies in South Asia. A clinical analysis of the organophosphate poisoning case explained that the majority of the exposure was intentional rather than being accidental.¹³ The involvement of pesticides and pharmaceutical drugs as major toxic agents is also supported by existing studies, where a systematic review and meta-analysis reported that in India the leading cause of poisoning in adults is due to pesticides.¹⁴ Furthermore, organophosphate poisoning is reported to be the most common toxic agent in poisoning due to their widespread use in agriculture. A study demonstrated that organophosphate poisoning accounts for the most poisoning in developing countries.¹⁵

The higher prevalence of the poisoning among the young adults may be associated with social and psychological stress that may include occupational pressure and financial challenges, which might be the factors that may increase the likelihood of self-harm behavior.^{16,17} The predominance of the intentional poisoning may be due to easy availability of toxic substances such as medication and pesticides. Easy availability of pesticides within the household due to agricultural practices may increase the risk of ingestion during psychological distress.¹⁸ In addition, organophosphate poisoning pesticides are the most toxic agricultural poisoning which are easily available.¹⁹ Inferential analyses did not demonstrate statistically significant associations between age group and outcome, gender and poisoning pattern,

Table 1A: Sociodemographic Characteristics of Study Participants.

Variables	Category	n (%)
Age	18-25	17 (33.3)
	25-50	28 (54.9)
	>50	7 (11.8)
Gender	Female	32 (57.7)
	Male	20 (42.3)
Occupation	Housewife	32 (61.5)
	Student	11 (21.1)
	Farmer	4 (7.7)
	Others	5 (9.6)

Table 1B: Demographic characteristics of the participants.

Variables	n (%)
Mean Age	34.57±14.81 years
Median Age	31 years
Female	29 (56.9%)
Male	22 (43.1%)
Married	37 (72.5%)
Unmarried	14 (27.5%)
Primary Education	17 (33.5%)
Secondary Education	17 (33.5%)
Degree Education	16 (31.4%)
Missing Education Data	1 (2%)

Table 2: Patterns and type of Poisoning.

Variable	Category	n (%)
Manner	Intentional	43 (82.7%)
	Accidental	9 (17.3)
Type	Drug Overdose	16 (30.48)
	Organophosphate	13 (25)
	Envenomation	7 (13.5)
	Pyrethroids	6 (11.5)
	Household agent	5 (9.6)

poisoning agent and outcome, or time to hospital presentation and outcome. However, these findings should be interpreted cautiously because of the relatively small sample size and the low number of adverse outcomes.

This study presents a valuable insight into the epidemiological and clinical profile of acute poisoning in a tertiary care hospital. The study highlights very important trends in demographic characteristics, toxic agents involved, and their clinical outcomes associated with poisoning. However, limitations should be considered, since the study was conducted in a single tertiary care hospital, which limits the generalizability of the results with other studies, and due to the small sample size, it may restrict

the broader epidemiological conclusion. Another limitation is that the standardized poisoning severity assessment tool such as Poisoning Severity Score and Glasgow Coma Scale were not used in the study. Therefore, assessment of poisoning severity and its association with clinical outcomes could not be performed.

The findings of the study highlight the need for improved mental health awareness and access to psychological counselling services. Incorporating psychiatric evaluation may help identify the risk of self-harm. Public health intervention that regulates the availability of toxic pesticides and promotes safe storage of medication may reduce the incidence of poisoning. Further research should conclude in regional variation in poisoning patterns.

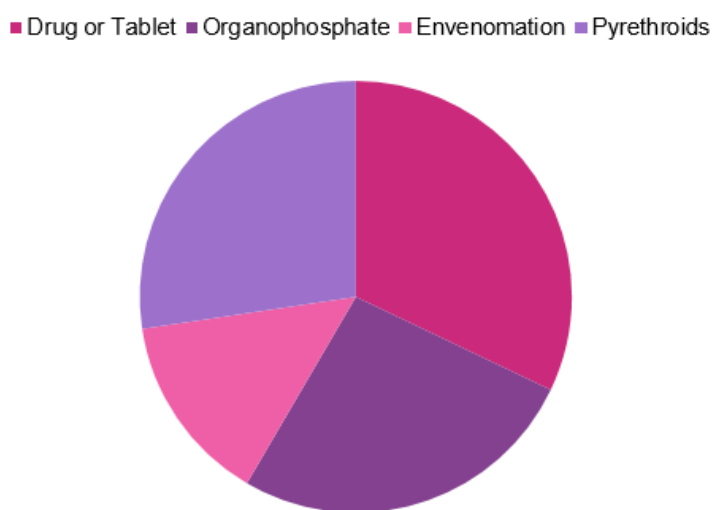


Figure 1: Distribution of types of Poisoning among study participants(n=52).

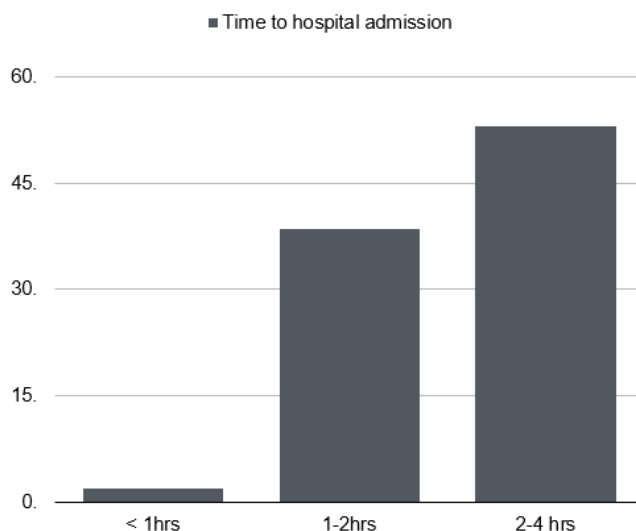


Figure 2: Distribution Of time interval between poison ingestion and hospital admission (n=52).

Table 3: Clinical presentation and time to hospital admission.

Variables	Category	n (%)
Symptoms	Vomiting	35 (67.3%)
	Abdominal Pain	10 (19.2)
	Neurological symptoms	9 (17.3)
Time to Hospital	<1 hr	1 (1.9)
	1-2 hr	20 (38.5)
	2-4 hr	19 (36.6)
	>4 hr	Others

Table 4: Treatment modalities and clinical outcomes.

Variable	Category	n (%)
Treatment	IV Fluids	52 (100)
	Gastric Lavage	27 (51.9)
	Antiemetics	48 (92.3)
	PPI	50 (96.2)
	Atropine	12 (23.1)
Outcome	Stable	49 (94.23)
	Discharged	38 (73.08)
	LAMA	14 (26.92)

Table 5: Association Between Gender and Manner of Poisoning.

Variables	Intentional Poisoning n (%)	Accidental Poisoning n (%)	Chi-Square (X2)	p-Value
Male (n=22)	16(27.3)	6(47.3)	0.614	0.433
FEMALE (n=28/29)	24(85.7)	4(14.3)		

Chi-square test used; $p < 0.05$ considered significantly.

Table 6: Inferential statistical analyses.

Variables	Categories	Outcomes/comparison	Stable n (%)	Not Stable n (%)	Test Used	p-Value
Age Group	18-25 years	Clinical outcome	16	1	Fisher's exact test	0.813
	26-50 years		26	1		
	>50 years		6	0		
Gender	Male	Clinical outcome	20	2	Fisher's exact test	0.916
	Female		28	0		
Time To Hospital Presentation	<2 hr	Clinical outcome	29	1	Fisher's exact test	1.000
	>2 hr		29	1		
Poisoning Agent Category	Drug overdose	Clinical outcome	15	0	Fisher's exact test	>0.05
	Organophosphate/pesticides		20	0		
	Snake bite/envenomation		6	2		
	Corrosives/household agents		4	0		
	Others		3	0		
Gender	Male	Manner of poisoning	Intentional: 16	Accidental: 6	Chi-square test	0.433
	Female		Intentional: 24	Accidental: 4		

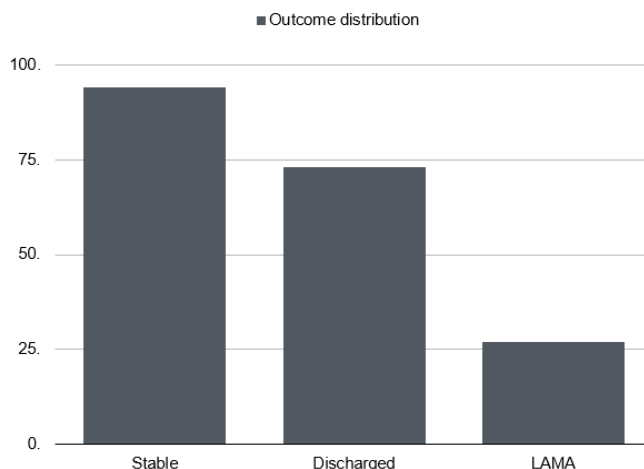


Figure 3: Distribution of clinical outcomes among patient with acute poisoning (n=52).

CONCLUSION

Acute poisoning primarily affects young adults, which is still a serious public health concern. The most prevalent type of poisoning was intentional self-poisoning, which was influenced by sociodemographic factors. Drugs, household agents and organophosphorus compounds were the common causes. Results were improved by early hospital admission and timely treatment, underscoring the need for improved emergency care, toxic substance regulation and community awareness.

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ABBREVIATIONS

ABC: Airway, Breathing, and Circulation; **ED:** Emergency Department; **Hr:** Hours; **IV:** Intravenous; **LAMA:** Left Against Medical Advice; **OP:** Organophosphate; **PPI:** Proton Pump Inhibitors.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

AUTHORS CONTRIBUTION

Namana conceptualized the study and collected the data, Rakshitha performed data analysis and interpretation, Sekhar drafted and revised manuscript, Dr. Raman supervised the study as guide and approved the final manuscript.

SUMMARY

The research concluded that young adult was most affected, with a higher incidence among female and intentional self-poisoning was the predominant mode of exposure. Drug overdose and Organophosphate poisoning were the most common toxic agents identified. Early hospital presentation and prompt supportive management resulted in favorable clinical outcome in majority of the patient. The study emphasizes the need for mental health support, regulation of toxic substance access and public awareness to reduce poisoning related morbidity and mortality.

REFERENCES

- Shadina S, Esmaily H, Sasanian G, Pajoumand A, Hassanian-Moghaddam H, Abdollahi M. Patterns of acute poisoning in Tehran-Iran in 2003. *Hum Exp Toxicol.* 2007;26(9):753-6. doi:10.1177/0960327107083017.
- Yang CC, Wu JF, Ong HC, Hung SC, Kuo YP, Sa CH. Taiwan national poison center: epidemiologic data 1985-93. *J Toxicol Clin Toxicol.* 1996;34(6):651-63. doi:10.3109/15563659609013825.
- Ibadi EA, Awad HK, Hussain LI. Environmental toxins and their organ-specific effects: a comprehensive review of human exposure and accumulation. *Journal of Agricultural, Environmental and Veterinary Sciences.* 2024;8(2):10-24. doi:10.26389/AJSRP.E250424.
- Shaheen S, Sultana S, Uddin MN, Mohammad AS. Principles of toxicology: a clinical review. *Asian J Res Pharm Sci.* 2018;8(3):145-50. doi:10.5958/2231-5659.2018.00026.7.
- Shinde P, Bhokare S. Systemic review on clinical management of poisoning. *Int J Indian Med.* 2025;6:21-28. doi:10.55552/IJIM.2025.6504.
- 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):351-60. doi:10.18311/ti/2024/v31i3/42001.
- Otorkpa O, Otorkpa C, Auta H, Ukah A. Pattern and impact of pesticide poisoning: a review of published case reports. 2024;12:10.21522/TJPH.2013.12.02. Art016.
- Kaur P, Prakash B. Medicolegal aspects of deaths due to poisoning occurred in cities of Punjab and the state of Himachal Pradesh. *J Forensic Sci Res.* 2025;9:100-03. doi:10.29328/journal.jfsr.1001087.
- Lalit PC, Mamta P. Assessment and diagnosis of poisoning with characteristics features in living or dead. *J Forensic Sci Criminal Inves.* 2018;10(4):555796. doi:10.19080/JFSCI.2018.10.555796.
- Kaswa R. An approach to the management of acute poisoning in emergency settings. *S Afr Fam Pract.* 2024;66(1):e1-e5. doi:10.4102/safp.v66i1.5841. PMID:38572878; PMCID:PMC10913156.
- Singh R, Yadav P, Tripathi S. A narrative review on emergency management of poisoning. *J Clin Diagn Res.* 2023;OE01-OE04. doi:10.7860/JCDR/2023/62534.18279.

12. Parekh U, Gupta S. Epidemio-toxicological profile of poisoning cases - a five years retrospective study. *J Forensic Leg Med.* 2019;65:124-32. doi:10.1016/j.jflm.2019.05.013. Epub 2019. PMID:31153007.
13. Kumar MR, Kumar GP, Babu PR, Kumar SS, Subrahmanyam BV, Veeraprasad M, *et al.* A retrospective analysis of acute organophosphorus poisoning cases admitted to the tertiary care teaching hospital in South India. *Ann Afr Med.* 2014;13(2):71-5. doi:10.4103/1596-3519.129876. PMID:24705111.
14. Mittal C, Singh S, Kumar-M P, Varthya SB. Toxicoepidemiology of poisoning exhibited in Indian population from 2010 to 2020: a systematic review and meta-analysis. *BMJ Open.* 2021;11(5):e045182. doi:10.1136/bmjopen-2020-045182. PMID:34031112; PMCID:PMC8149432.
15. Pandey S, Shrestha N. Organophosphorus poisoning among acute poisoning cases presenting to the emergency department of a secondary care centre: a descriptive cross-sectional study. *JNMA J Nepal Med Assoc.* 2022;60(249):435-38. doi:10.31729/jnma.7446. PMID:35633235; PMCID:PMC9252226.
16. Singhapathirana S, Mayurathan P. A study on deliberate self-harm by poisoning and associated risk factors at Batticaloa Teaching Hospital. *Cureus.* 2024;16(11):e73971. doi:10.7759/cureus.73971. PMID:39703260; PMCID:PMC11658859.
17. Raut A, Shaj K, Pawar A. Psychosocial factors as risk factor in suicidal poisoning: a cross-sectional study. *Asian J Pharm Clin Res.* 2017;10(8):284. doi:10.22159/ajpcr.2017.v10i8.18983.
18. Banerjee S, Chowdhury A. Globalisation of pesticide ingestion in suicides: an overview from a deltaic region of a middle-income nation, India. 2017. doi:10.1057/978-1-137-39510-8_32.
19. Kumar S, Kaushik G, Villarreal-Chiu JF. Scenario of organophosphate pollution and toxicity in India: a review. *Environ Sci Pollut Res Int.* 2016;23(10):9480-91. doi:10.1007/s11356-016-6294-0. Epub 2016. PMID:26916265.

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