MAK HILL Publications Research Journal of Medical Sciences

Research Article
doi: 10.36478/makrjms.2025.4.13.17

OPEN ACCESS

Key Words
Acute poisoning, pesticides

Corresponding Author
S. Sivakumar,
Department of Emergency Medicine Sree Mookambika Institute of Medical Sciences College Kanyakumari, Tamil Nadu, India

Author Designation
[1]Associate Professor
[2]Junior Resident

Received: 25th February 2025
Accepted: 11th April 2025
Published: 21st May 2025

Citation: R. Maheshwari and S. Sivakumar, 2025. Acute Poisoning Cases Admitted to a Tertiary Hospital Emergency Department: A Prospective and Discriptive Study. Res. J. Med. Sci., 19: 13-17, doi: 10.36478/makrjms.2025.4.13.17

Acute Poisoning Cases Admitted to a Tertiary Hospital Emergency Department: A Prospective and Discriptive Study

[1]R. Maheshwari and [2]S. Sivakumar
[1]*Department of Emergency Medicine, Sree Mookambika Institute of Medical Sciences Kanyakumari, Tamil Nadu, India*
[2]*Department of Emergency Medicine Sree Mookambika Institute of Medical Sciences College Kanyakumari, Tamil Nadu, India*

Abstract
The aim of this study was to determine the demographic, etiologic, and clinical characteristics of acute poisoning cases admitted to the Emergency Department of sree mookambika college of mediccal sciences, to determine the risk factors leading to poisoning and to determine the follow-up periods of these cases in the emergency department and intensive care unit. Poisoning remains a common cause of morbidity and mortality worldwide Acute poisoning is characterized as exposure to a toxic substance for a short period of time, typically less than 24 hours In many parts of the world, acute poisoning is a big public health problem that can be avoided and leads to illness and death. In the past, statistics on patients poisoned in emergency departments in India prospective study included patients aged 18 years and older who were admitted to the emergency department of sree mookambika college of medical sciences with acute poisoning during the 6-month period between April 15, 2024 and October 15, 2025. This discriptive study was planned prospectively to include cases of acute poisoning in individuals aged 18 years and older who were admitted to the Sree mookambika college of medical sciences Emergency Department. Among a total of 236,464 patients admitted to the adult emergency department within a 6-month period, 432 (0.18%) patients aged 18 years and over were followed up with a diagnosis of acute poisoning. The present data provide additional information on the epidemiology of acute poisoning.. The findings showed that the incidence of acute poisoning was 0.18%. Females outnumbered males and poisoning was most common in young adults aged 18-25 years. We also observed that most cases of poisoning were intentional, especially suicidal. Our study showed that therapeutic drugs were the most common group of toxic agents

INTRODUCTION

Poisoning remains a common cause of morbidity and mortality worldwide[1]. Acute poisoning is characterized as exposure to a toxic substance for a short period of time, typically <24 hours[2]. In many parts of the world, acute poisoning is a big public health problem that can be avoided and leads to illness and death[3,4]. In the past, statistics on patients poisoned in emergency departments in India. were quite scarce. However, improved records and data on acute or emergency poisoning cases through the Turkish Statistical Institute (TUIK) and the 114 National Poison Call Center have helped us understand the importance of this health problem[5]. In many countries, acute poisoning due to drugs and chemicals is among the most common reasons for admission to emergency departments. In the United States of America (USA), a developed country, the annual incidence of poisoning cases has been reported at 0.68[6]. In studies conducted in our country on acute poisonings, the annual incidence of admissions to emergency departments due to poisoning was found to be between 0.7% and 10.1%[7-11]. The factors leading to poisoning may vary according to the region of residence, the customs and traditions of the society and the socioeconomic level. For this reason, each country and even each region should conduct studies analyzing the etiological and demographic characteristics of poisoning and take precautions. Obtaining the latest up-to-date information on acute poisoning is also important for the planning of health and education services. The aim of this study was to determine the demographic, etiologic and clinical characteristics of acute poisoning cases admitted to the Emergency Department of sree mookambika college of mediccal sciences, to determine the risk factors leading to poisoning, and to determine the follow- up periods of these cases in the emergency department and intensive care unit.

MATERIALS AND METHODS

This prospective study included patients aged 18 years and older who were admitted to the emergency department of Sree mookambika college of medical sciences with acute poisoning during the 6-month period between April 15, 2024 and October 15, 2025. This discriptive study was planned prospectively to include cases of acute poisoning in individuals aged 18 years and older who were admitted to the Sree mookambika college of medical sciences Emergency Department. The resident physicians entered patient data into the pre-established database. Patients who consented to participate in the study were included in the study. In addition, patients with incomplete data were excluded from the study. The study was conducted in accordance with the ethical rules of the helsinki declaration. This study is a publication produced from a thesis.

The study examined various sociodemographic factors of the patients in the database, including age, gender, educational attainment, marital status, occupation, and monthly family income level, as well as the specific details regarding the nature and type of intoxication. The evaluation of the patients' level of consciousness upon their arrival at the emergency department was conducted using the Glasgow Coma Scale (GCS). This study assessed acute poisoning clinical outcomes (discharge, admission to the critical care unit or ward, transfer to another hospital, voluntary departure from the clinic, or death). Mortality rates and discharge times from the intensive care unit were also analyzed in the study. In determining the type of poisoning, information was obtained from the patients themselves or their relatives who were present at the time of admission to the emergency department and the causes of poisoning due to suicide, accidental ingestion or abuse or addiction of toxicological substances were investigated. Patients who attempted suicide were consulted by psychiatry at the end of their emergency department follow-up. In this way, it was possible to distinguish between real suicide attempts and impulsive suicide attempts. Biopsychosocial factors underlying suicidal ideation were also investigated. Statistical analysis was done using the statistical package for social sciences (SPSS).Different statistical methods were used as appropriate. Mean±SD was determined for quantitative data and frequency for categorical variables. The independent t-test was performed on all continuous variables. The normal distribution data was checked before any t-test. The Chi-Square test was used to analyze group difference for categorical variables. A $p<0.05$ was considered significant.

RESULTS AND DISCUSSIONS

Among a total of 236,464 patients admitted to the adult emergency department within a 6-month period, 432 (0.18%) patients aged 18 years and over were followed up with a diagnosis of acute poisoning. Demographic data for 432 patients is shown in Table 1. In our study, 150 (34.7%) of the patients admitted with the diagnosis of acute poisoning were male, and 282 (65.3%) were female. The mean age of the patients was 30.93±12.88 years. Considering the age distribution of the patients, the highest number of applications was found in the 18-25 age group, with a rate of 44.9%. Most of the applications were made by those living in the city center, with a rate of 89.8%. When the cases were analyzed according to marital status, it was observed that a higher proportion of the patients were married (61.1%). In addition, according to educational status, the majority of the patients (65%) were primary and secondary school graduates. When compared according to the monthly income level of the household,

Table 1: Sociodemographic Characteristics of Poisoning Cases

Variables	Count (N:432)	Percentage (%)
Sex		
Male	150	34.7
Female	282	65.3
Age Groups (years) - mean age: 30.93±12.88		
18-25	194	44.9
26-35	105	24.3
36-44	70	16.2
45-54	34	7.9
55-64	19	4.4
65-81	10	2.3
Marital status		
Married	264	61.1
Single	146	33.8
Widowed/divorced	22	5.1
Education Status		
Illiterate	20	4.6
Primary (elementary-middle school)	281	65
High School	108	25
University	23	5.3
Place of Residence		
City	388	89.8
District	25	5.8
Town	7	1.6
Village	12	2.8
Job Status		
Working	126	29.2
Unemployed	66	15.3
Housewife	175	40.5
Retired	18	4.2
Student	40	9.3
Military Personnel	7	1.6
Monthly income level (TL)	mean income: 1239.76± 709.58	
0-950	134	31.0
951-1900	217	50.2
1901-3800	77	17.8
3801-5000	4	0.9

it was found that the highest number of visits to the emergency department were among patients with low income levels (the minimum wage was calculated as 950 TL The manifestation and causes of acute poisoning cases are summarized in Table 2. Accordingly, out of 432 patients, 286 (66.2%) were poisoned due to suicide attempts, 127 (29.4%) due to accidents, 19 (4.4%) due to abuse oraddiction, 273 (63.2%) due to drugs, 19 (4.4%) due to chemical gas, 23 (5.3%) due to pesticides, 25 (5.8%) due to corrosive agents, 53 (12.3%) due to food, and 39 (9.3%) due to other causes. The median Glasgow Coma Scale (GCS) value of the patients upon their arrival at the emergency department was 15, with a minimum value of 4 and a maximum value of 15. The number of intoxications with a single drug was 176 (64.5%), and the number of multiple drug exposures was 97 (35.5%) (N=273). The most common cause and percentage of poisonings are summarized in Table 3. The most common exposure agents were analgesics with a rate of 31.3% (NSAIDs 21.6%., paracetamol 9.7%) and antidepressants with a rate of 22.2%. Carbon monoxide (CO) was identified as the causal agent in all 19 patients (100.0%) who were affected by chemical gas poisoning. Among the cases of acute pesticide poisoning, a majority of 60.9% (n=14) were attributed to insecticides, while 30.4% (n=7) were caused by rodenticides. Herbicides accounted for a smaller proportion of cases at 8.7% (n=2). Among 15 patients poisoned with insecticides, the causative organophosphate was found in 8 patients (53.3%). The predominant cause of foodborne illness was attributed to the consumption of mushrooms, accounting for 58.5% of reported cases. Among the cases of poisoning involving caustic compounds, it was observed that 16 patients, including 64% of the total, experienced hazardous exposure specifically due to bleach. In the venomous animal bites/ stings group, scorpion stings (53.3%) were the most common animal contact poisoning. Besides, ethanol was found to be the most common agent in 6 out of 7 patients (85.7%) with alcohol-only poisoning. Out of the 11 individuals who were admitted to the emergency department due to illicit drug use, it was seen that 6 patients (54.5%) reported the use of synthetic cannabis, specifically bonzai and its derivatives. Additionally, 3 patients (27.3%) acknowledged the use of cannabis, while 2 patients (18.2%) reported the use of heroin.

Table 2: Types and Manifestation of Acute Poisoning

		Count	Percent (%)
Types	Drugs	273	63.2
	Chemical Gas	19	4.4
	Pesticide	23	5.3
	Corrosive Agent	25	5.8
	Nutrients	53	12.3
	Other*	39	9.3
	Total	432	100.0
Manifestation	Suicide attempt	286	66.2
	Accident	127	29.4
	Abuse/addiction	19	4.4

Table 3: The Most Common Agents and their Percentages in Acute Poisonings

Type of Poisoning	Most common agent	Percent(%)
Drugs Analgesics (n:176)	Analgesics	%31.3
Paracetamol+NSAIDs (n:97)	Paracetamol+NSAIDs	%13.40
Chemical Gas (n:19)	Carbon Monoxide	% 100.0
Pesticides (n: 23)	Organophosphate	% 34.78
Corrosive Agent (n:25)	Bleach	% 64.0
Food (n:53)	mushrooms	% 58.5
Other* (n: 39)	Scorpion bite/sting	% 20.51

*(15 patients with poisonous animal bites or stings, 9 patients with drugs, 7 patients with alcohol and 8 patients with more than one type of exposure)

In studies conducted in different centers, there are differences in the rates of poisoning cases admitted to the emergency department[12,13]. This is due to the fact that in the regions where hospitals are established, the sociodemographic characteristics, customs and traditions of the people in that region differ between regions and even countries. The annual incidence of acute poisoning cases admitted to emergency rooms in Turkey varies between 0.7% and 2.4%[7-11], according to studies published in the literature. This rate was determined to be 0.18% in our study. In comparison to other research conducted in Turkey, this rate was found to be low. We believe that the fact that green area patients make up the majority of annual emergency department visits (50.7%) and that the emergency department is used as an outpatient clinic has a significant impact on this. In studies conducted in Turkey, it is observed that poisoning cases are mostly

in women and young people[14-16]. Similar results were also obtained in our study. In addition, when the age distribution of the patients was analyzed, it was observed that most of the applications were in the 18-25 age group. Consistent with findings from previous research conducted in our country and neighboring Iran, which are considered developing nations, the majority of acute poisoning cases in our study consisted of individuals residing in urban areas (89.8%). Furthermore, a significant proportion of these cases were primary school graduates (65%), individuals with low income levels (81.2%), married individuals (61.1%) and housewives (40.5%). In our study, the most common agent taken for poisoning was high dose drug intake (63.2%). This rate is similar to the results of studies conducted in other regions of Turkey. According to the reports of other country studies, drugs were found to be the most commonly ingested agent in acute poisonings[12,13]. However, drugs may not be the most common agent in countries with a high rate of agriculture. For example, in a study conducted in Thailand, pesticides (41.5%) were found to be the most common agent (24). In our study, analgesics (NSAIDs 21.6%., paracetamol 9.7%) and antidepressants (22.2%) were the most common agents in single drug poisonings, respectively. The ranking remains unchanged for all drug poisonings, including combinations. We think that this is due to the easy access and widespread use of analgesics and antidepressants. Unlike benzodiazepines, antidepressants, which can be dispensed from pharmacies even without a prescription, are considered to be the most frequently used agents in acute poisonings due to their unintentional consumption as 'feel-good' drugs. For this reason, we believe that trainings should be provided to raise awareness among the public about these drugs and their side effects in order to be aware of the side effects that can be caused by high doses of these drugs, especially paracetamol, which seems innocent, and we strongly recommend that antidepressant drugs should be given by pharmacies against prescription in order not to be consumed off-label. While paracetamol was the most common analgesic agent in some studies conducted in some regions of Turkey[8-10], NSAIDs were found to be the most common agent in some studies including our study[7]. In our study, the mortality rate was found to be 0.46 % in patients admitted with acute poisoning. Eddlestone *et al.* reported that mortality rates due to poisoning varied between 0% and 50%. In the same study, the reasons for the wide range of mortality rates were shown to be the severity of the poisoning, the ingestion of lethal or nonlethal agents and the fact that serious cases resulting in death occurred before hospitalization. In our study, deaths were due to methanol (abuse) and organophosphate ingestion (suicide attempt) and the gender of the patients was male in both deaths. When the biopsychosocial reasons for suicide attempts were analyzed, familial problems were the most common reason (57.3%). It has been reported that 80%-90% of the cases of self-harm in England are between 80% and 90% and 50% of these cases are due to family problems. Furthermore, in a multicenter study conducted by Schmidtke *et al.* investigating the sociodemographic characteristics of suicide attempts in European countries, it was reported that suicide attempts were mostly in the low social class., were most common in women aged 15-25 years and least common in the group aged 55 years and older., were mostly among the unmarried (singles and widows) and in cases with low education level., unemployment in men and economic independence in women was an important risk factor and previous suicide attempts were common in suicide attempt cases. Given that the majority of the participants in our study were married individuals and housewives, 66.5% of whom attempted impulsive suicide, it is reasonable to assume that the suicidal act was motivated by psychological distress due to household problems, as well as a desire to escape from adverse circumstances or to obtain secondary benefits. In addition, socioeconomic inadequacy was the second most common cause of suicide attempts. Upon comparing the preexisting chronic diseases or addictions of individuals who had attempted suicide with the nature of their suicide attempts, it was noted that those with underlying psychiatric disorders, substance and alcohol dependencies, and chronic illnesses exhibited a higher frequency of real suicide attempts. Our findings are consistent with previous studies. Besides, Schmidtke *et al.* reported that an average of 15% of suicide attempters under observation made one or more suicide attempts. In our study, similar to the literature, it was found that 16.8% of suicide attempters continued to have suicidal ideation. Therefore, in order to minimize the rate of suicide attempts in the future, such patients should definitely be consulted by psychiatry in emergency departments and treatment and follow-up of the patients should be planned.

CONCLUSION

The present data provide additional information on the epidemiology of acute poisoning. The findings showed that the incidence of acute poisoning was 0.18%. Females outnumbered males and poisoning was most

common in young adults aged 18-25 years. We also observed that most cases of poisoning were intentional, especially suicidal. Our study showed that therapeutic drugs were the most common group of toxic agents, followed by food poisoning. In our study, acute poisoning cases were mostly urban dwellers, primary school graduates, people with low income, married and housewives. CO poisoning is still a serious problem in india, especially in winter. Scorpion stings are the most common type of venomous animal bites or stings. In this respect, protective measures should be taken. Alcohol and substance abuse is still a serious problem in india. In our study, one out of two deaths in acute poisoning cases is due to alcohol poisoning. Family problems and socioeconomic inadequacy were found to be the most common biopsychosocial reasons for suicide attempts. In order to reduce the rate of suicide attempts, risk factors should be identified through multicenter studies and measures should be taken accordingly., family support lines and social education programs should be established to minimize family problems.

REFERENCES

1. Frithsen I.L. and W.M. Simpson., 2010. Recognition and management of acute medication poisoning. Am Fam Physician., 81: 316-323.
2. Zhang Y., B. Yu, N. Wang and T. Li., 2018 Acute poisoning in Shenyang,China: a retrospective and descriptive study from 2012 to 2016. BMJ Open. Vol. 8: 10.1136/bmjopen-2018-021881.
3. Senarathna L., N. Buckley, S. Jayamanna, P. Kelly, M. Dibley and A. Dawson., 2012. Validity of referral hospitals for the toxicovigilance of acute poisoning in Sri Lanka. Bull. World Health Org.ization, Vol. 90: 10.2471/BLT.11.092114.
4. Mazer-Amirshahi M., C. Sun, P. Mullins, J. Perrone, L. Nelson and J.M. Pines., 2016. Trends in Emergency Department Resource Utilization for Poisoning-Related Visits, 2003–2011. J. Med. Toxicol., Vol. 12: 10.1007/s13181-016-0564-6.
5. GÖNEY G., 2020. 1923'DEN Günümüze türkiye'de zehirlenme oranlari ve nedenlerinin analizi. SDÜ Tip Fakültesi Dergisi, Vol. 27: 10.17343/sdutfd. 699025.
6. Mowry J.B., D.A. Spyker, L.R. Cantilena, N. McMillan and M. Ford., 2014. 2013 Annual Report of the American Association of Poison Control Centers' National Poison Data System (NPDS): 31st Annual Report. Clin. Toxicol., Vol. 52:. 10.3109/15563650.2014.987397.
7. Özköse Z. and F. Ayoglu., 1999. Etiological and demographical characteristics of acute adult poisoning in Ankara, Turkey. Hum. and Exp. Toxicol., Vol. 18: 10.1191/096032799678839446.
8. Goksu S., C. Yildirim, H. Kocoglu, A. Tutak and U. Oner., 2002. Characteristics of Acute Adult Poisoning in Gaziantep, Turkey. J. Toxicol.: Clin. Toxicol., Vol. 40: 10.1081/clt-120016953.
9. Pekdemir M., C. Kavalci, P. Durukan and M. Yildiz., 2002. Acil Servisimize Basvuran Zehirlenme Olgularinin Degerlendirilmesi. Turk J Emerg Med., 2: 36-40.
10. Tüfekçi I.B., A. Çurgunlu and F. Sirin., 2004. Characteristics of acute adult poisoning cases admitted to a university hospital in Istanbul. Hum. and Exp. Toxicol., Vol. 23: 10.1191/ 0960327104ht460oa.
11. Cengiz M., Z. Baysal, S. Ganidagli and A. Altindag., 2006. Characteristics of poisoning cases in adult intensive care unit in Sanliurfa, Turkey. Saudi Med J., 27: 1497-502.
12. McCaig, L.F., L. McCaig and C.W. Burt, 1999. Poisoning-Related Visits to Emergency Departments in the United States, 1993–1996. J. Toxicol.: Clin. Toxicol., 37: 1-10.0.
13. Ponampalam R., H.H. Tan, K.C. Ng, W.Y. Lee and S.C. Tan., 2009. Demographics of toxic exposures presenting to three public hospital emergency departments in Singapore 2001–2003. Int. J. Emergency Med., Vol. 2: 10.1007/s12245-008-0080-9.
14. Ayan M., N. Basol, T. Karaman, U. Tas and M. Esen., 2012. Retrospective Evaluation of Emergency Service Patients with Poisoning: A 20 Month Study. J. Acad. Emergency Med., Vol. 11: 10.1007/s12245-008-0080-9.
15. Çetin N.G., H. Beydilli and O. Tomruk., 2004. Acil servise basvuran intoksikasyon olgularinin geriye dönük analizi. SDÜ Tip Fak Derg., 11: 7-9.
16. Sahin H.A., I. Sahin and F. Arabaci., 2003. Sociodemographic factors in organophosphate poisonings: a prospective study. Hum Exp Toxicol., Vol. 22: 10.1191/0960327103ht376oa