

Study of Poisoning Patients Presenting in Emergency Medicine Department

Pushkar Pradip Shah¹, Seema Shripad Karhade²

¹MBBS, MD (Medicine), FACEE, Associate Professor, Department of Emergency Medicine, Smt. Kashibai Navale Medical College and General Hospital, Narhe, Pune. 411041

²MBBS, MD (Anaesthesia), FACEE, Professor & HOD, Department of Emergency Medicine, SmtKashibai Navale Medical College and General Hospital, Narhe, Pune. 411041

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Corresponding Author: Dr. Pushkar Pradip Shah

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Abstract:

Introduction: Poisoning is one of the common emergency seen in Emergency Medicine department (EMD), which affects world health. Raising public awareness, implementing preventative measures, and enacting legislative steps are all necessary to tackle this complexity. Rapid assessment, tailored therapy in EMD are essential for poisoning situations. Developing targeted interventions and mitigating poisoning effect on public health depends on our ability to understand poisoning patterns and outcomes.

Aims and Objectives: To study poisoning cases presented in the Emergency Medicine Department, including the type and manner of poisoning.

Material and Methods: An observational study spanning 2 years (1stJanuary 2022 to 31stDecember 2023) was conducted in Emergency Medicine Department (EMD) of SKN Medical College & General Hospital, Pune. Data sourced from hospital records with approval. Poisoning diagnosed via medical history, exam, and laboratory tests. Analyzed details include poisoning mechanism, arrival time, consciousness, hospital stay, outcomes, and demographics. Inclusion criteria: Patients presented to EMD with complete records and poisoning diagnosis.

Result: The study analyzed 143 cases of poisoning, with age and gender distributions highlighted in the socio-demographic data presented below. Most cases were in 20-29 years age group (47.55%), with males (51.04%) being more prevalent. Types and methods of poisoning, showing that most cases were intentional (84.61%). Various hospitalization criteria, such as arrival timings, patient state, length of stay, and outcomes, can be used to understand better and handle cases of poisoning.

Conclusion: Poisoning was more common in young population with organophosphorus poisoning being major cause. Most of the patients had intentional ingestion. Easy availability of such compounds should be checked. Early presentation and treatment will improve outcome.

Keywords: Poisoning, Organophosphorus, Corrosive, Emergency Medicine Department.

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Introduction

Poisoning is a condition of medical or societal disarray caused by the absorption of an external material that exceeds the individual's tolerance limits, resulting in harmful repercussions. This multidimensional phenomenon includes accidental, purposeful, or exploratory contact with hazardous chemicals, which cause a variety of symptoms and health consequences. Its etiology includes a wide range of substances, including pharmaceuticals, chemicals, and hazardous compounds, all of which have the potential to cause severe health complications ranging from acute distress to fatal outcomes, necessitating immediate medical intervention and, in some cases, hospitalization or death [1,2].

Poisoning comes in a wide range of forms and from a variety of causes. Major contributors to the toxic landscape include methyl alcohol, organophosphates, mushrooms, and medications. Eating seafood poses a serious and little-known risk. There are many species that can cause serious injuries or even death. The intricacy of poisoning scenarios is further increased by exposure to corrosives, carbon monoxide, food poisoning, and deadly animals. Misuse of agricultural pesticides and medications increases the range of possible hazards, underscoring the significance of caution and preventive steps in reducing the effects of these many poisonings [3-6].

Poisoning is becoming a major global health concern that is causing a high rate of morbidity and

mortality in many different parts of the world. As evidenced by the fact that cases were reported in Nepal in less than a year and that there have been concerning cases in Brazil's Federal District, this problem is widespread and important globally, with an estimated yearly mortality toll [7,8]. Because of this, managing this complicated health issue necessitates a comprehensive and team-based strategy to protect the general public's well-being [7].

Effective management of poisoning is a crucial factor in achieving positive results, as prompt action can prevent severe illness and death. Using a personalized strategy based on pharmacokinetics and customized intervention standards, such as activated charcoal and counteragents, becomes essential for efficient risk evaluation and management that follows [9]. Poisoning is still a serious public health issue, especially when it affects children. To address this, a methodical approach that includes several phases of clinical assessment, decontamination, antidote administration, and supportive therapy is required. A solid understanding of toxidromes and skillful passage through the phases of management constitute the foundation for treatment initiatives that are successful [10]. The susceptibility of children highlights the necessity for coordinated efforts and specialized resources committed to handling pediatric poisoning patients, even in the face of advancements in reducing pediatric poisoning-related morbidity and mortality. This would ensure thorough and well-designed care routes [11].

The emergency medicine department (EMD) plays a key role in the care of acute poisoning. Within its walls, acute poisoning cases are very common and require careful attention, as the average patient is only 26 years old. Of all the drugs consumed, the most commonly shown to be harmful are analgesics, paracetamol, and antidepressants. Through a sophisticated comprehension of every patient's distinct requirements, the EMD coordinates early risk assessment, stabilization, and customized treatment plans [12]. These situations, which frequently result from either suicidal thoughts or unintentional disasters, demand immediate attention [13]. The EMD's mission goes beyond providing stabilization alone; it also includes the vital duties of determining the poisonous substance and enabling subsequent referrals for full treatment, which encapsulates its essential function in the chain of care for patients who have been poisoned [12,13].

Investigating poisoning cases in emergency medicine is extremely important for several strong reasons. First of all, poisoning is a serious public health concern that is especially prevalent in areas like India due to its high prevalence and resulting

death rates [14]. Second, the field of poisoning diagnosis and treatment has its own set of challenges that require skillful navigating through a variety of situations, including intentional self-harm and unintentional exposures. It is critical to identify the causal factor promptly and offer suitable remedies [15]. Finally, the possibility of severe morbidity and death emphasizes the need for a thorough understanding of patterns, etiological factors, and outcomes. This will enable the development of effective management and preventive measures that are specifically designed to lessen the effects of this complex health issue [16,17].

Method

Research Design

This observational study was conducted in SKNMC & GH, Pune from 1 January 2022 to 31 December 2023 for duration of 2 years. All the patients coming to our hospital's emergency medicine department during the research period were considered. The necessary data was taken from the medical facility's records after obtaining necessary approvals. The poisoning was diagnosed based on the patient's medical history, physical examination, and laboratory test results. The details including the mechanism of poisoning, time of arrival, status of consciousness during the presentation, duration of hospital stay and outcomes were analyzed and conclusion was drawn. The study also evaluated the occurrence of the poisoning cases among the various age groups and gender.

Inclusion and Exclusion criteria

Inclusion:

- Patients visiting the medical facility's emergency department from January 2022 to December 2023.
- Patients were diagnosed with poisoning by medical history, physical exam, and lab tests.

Exclusion:

- Patients not diagnosed with poisoning in EMD.
- Patients presented with poisoning beyond the study period.

Statistical analysis: The study was conducted using SPSS 27 and MS Excel for effective statistical analysis and other calculations, respectively. The discrete data were presented as frequency and percentage while the continuous data were expressed as mean value and the standard deviation. The diagnosis, age, gender, trends in poisoning, time-series results, and outcome were all recorded. The level of significance was considered to be $P < 0.05$.

Result

Table 1 displays the socio-demographic data about 143 poisoning cases. First, the table shows the total number of instances (n=143) and their percentages. Cases are grouped according to age group. Most cases (47.55%) are from 20-29 years age group, followed by 32.16% in 30-39 year age group.

9.09% in 40-49, 8.39% in <20 years and 2.79% >49 years group. The second parameter shows the breakdown of the cases by gender, with men making up 51.04% and females 48.95%. These socio-demographic insights help identify poisoning demographics, which can drive age-specific to gender detection and reaction measures.

Table 1: Socio-demographic findings

Parameters	Number of cases n=143 (%)
Age group (years)	
<20	12 (8.40%)
20-29	68 (47.55%)
30-39	46 (32.16%)
40-49	13 (9.09%)
>49	4 (2.80%)
Gender	
Males	73 (51.04%)
Females	70 (48.95%)

Table 2: Details of the poisoning

Parameters	Number of cases (n=143); %
Manner of poisoning	
Intentional	121 (84.61%)
Accidental	22 (15.38%)
Homicidal	-
Type of poison	
Organophosphorus	56 (39.16%)
Corrosive	23 (16.08%)
Rat Poison	14 (9.79%)
Kerosene	3 (2.10%)
Drugs/Medications	28 (19.58%)
Snake bite	12 (8.39%)
Scorpion sting	4 (2.80%)
Unknown	3 (2.10%)

Table 2 details the nature and types of poisons used in 143 cases of poisoning. The table's first row shows the total number of cases (n=143) and their respective percentages. The manner of poisoning distinguishes intentional from accidental cases, with 84.61% intentional and 15.38% accidental.

The lack of any recorded homicidal incidents in this dataset is notable. The second parameter lists type of poison with organophosphorus being the most common (39.16%) cause. Other causes being corrosive, rat poison, kerosene, drugs/medications, snake bite, scorpion sting and unknown.

Table 3: Chronological details

Parameters	Number of cases n=143 (%)
Time of hospital arrival after poison intake (hours)	
Within 4	104 (72.73%)
After 4	39 (27.27%)

Condition of the patient at the time of presentation	
Unconscious	51 (35.67%)
Conscious	92 (64.33%)
Hours of stay in EMD (hours)	
0-2	38 (26.58%)
2-4	69 (48.25%)
4-6	36 (25.17%)
Disposition	
Admitted to the ICU	118 (82.51%)
Left against medical advice	25 (17.49%)

Table 3 shows poisoning-related hospitalization parameters. The first parameter describes the duration from poison ingestion/ exposure to presentation in EMD; 72.73% of patients arrived within 4 hours, while 27.27% arrived after that period. The second metric shows the patient's status at presentation; 35.67% were unconscious and 64.33% were conscious. The third parameter divides hours of stay in EMD into three intervals: 0-2 hours, 2-4 hours, and 4-6 hours, with 48.25% disposed in 2-4 hours from EMD. No patient stayed for more than 6 hours in EMD. Finally, we have patient outcomes, which show that 82.51% admitted to the Intensive Care Unit (ICU) and 17.49% left against medical advice.

Discussion

Poisoning is one of the commonest emergency presented in EMD in developing countries like India. Type of poison varies from place to place and may change over time period. Hence it is important to be aware of current trend in the poisoning in the region.

Majority of our patients (47.55%) were from 20-29 years age group followed by 30-39 years age group (32.16%). In another study, Bhoopendra Singh et al found most number of patients (40.50%) in 20-29 years age group followed by < 20 years age group (23.20%) [18]. A study by Mukul Joshi et al showed results similar to our study with maximum number of patients (56.60%) in 20-29 years age group followed by 30-39 years age group (20.80) [19]. High incidence in young age group is due to the fact that this age group is exposed multiple determining factors like education, marriage, family, job, life settlement. All this put additional mental stress in young age.

In our study, 84.61% patients had intentional poisoning while 15.38% patients had accidental poisoning. In a study, Bhoopendra Singh et al found 69% patients had intentional poisoning and 28% had accidental [18]. In another study by Mukul Joshi et al, intentional poisoning was in 80% patients while accidental poisoning was in 15.80%

patients [19]. All these studies point that intentional poisoning for suicidal purpose is still seen in most of the patients. Psychiatric counselling can improve this situation.

In our study, Organophosphorus poisoning was the commonest cause (39.16%) followed by Drugs/Medications (19.58%) and Corrosives (16.08%). In a study, Bhoopendra Singh et al found pesticide as commonest cause (35.7%) followed by snake bite (13.4%) [18]. In another study by Mukul Joshi et al, Organophosphorus poisoning was most common cause (25.80%) similar to our study, however next most common cause was Corrosives (17.50%) [19]. Easy availability of organophosphorus compounds is the main reason for it being commonest cause.

Clinical protocols should place a high priority on parent education, child-resistant container advocacy, and the promotion of safe storage habits, even in the absence of conclusive proof about the efficacy of poison prevention measures. Emergency medicine should prioritize targeted antidote administration, supportive care, and quick first aid measures above needless stomach cleansing procedures. Public health measures should take a holistic strategy to address suicide risk factors and prevent linked morbidity and mortality, while prevention strategies should concentrate on managing lead sources, encouraging safe storage, and strengthening global networks for prompt poison detection [20-22].

Conclusion

This study concluded that the majority of poisoning among patients presenting to the Emergency Medicine Department. It was equivalent to other studies performed in similar environments. On the other hand, drug poisoning appeared to the incline. Furthermore, psychiatry consultation was needed for patients who consciously poisoned themselves while they were hospitalized in order to decline the probability that they would attempt self-harm. Compliance with regulations regulating the sale of medication and insecticides is mandatory. The

study reveals several research gaps in the understanding and management of poisoning cases in emergency departments. While the study identifies age and gender disparities, it lacks exploration of underlying factors contributing to these demographic patterns, such as socio-economic and cultural influences. Moreover, while highlighting the importance of psychiatric consultation for self-harming patients, it overlooks the adequacy of mental health support services in emergency settings. Future research could address these gaps by employing longitudinal studies to track poisoning trends, conducting multifactorial analyses to understand contributing factors, and evaluating interventions and policies to enhance poisoning prevention and management strategies. Early presentation and treatment initiation will improve the outcome in poisoning patients.

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