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Original Article

Current Trends of Poisoning Cases in a Tertiary Care Centre of Karnataka, India

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ABSTRACT

Background: Acute poisoning is a significant health concern in developing countries like India. This study aimed to understand the current trends of acute poisoning in a tertiary care center in Karnataka, India.
Methods: A retrospective observational study was conducted over three months in 2022, including all inpatients admitted with a history of acute poisoning.
Results: Of the 190 patients, 57% were males, with a mean age of 34 years. The majority were laborers (45%) or housewives (39%), illiterate (36%), and from rural areas (64%). The most common mode of poisoning was oral (80%), predominantly with pesticides (43%). The primary reason for poisoning was suicidal intent (76%). Clinically, most patients had mild to moderate severity, with 44% requiring ICU admission, and a mortality rate of 15%.
Conclusion: The study underscores the influence of socio-demographic factors in acute poisoning and the critical need for prompt management. The findings can guide healthcare providers in creating targeted strategies for prevention, early detection, and management of acute poisoning cases.

Key Words: *Acute poisoning, tertiary care center, Karnataka, retrospective observational study, socio-demographic factors, pesticides, ICU admission, mortality rate*

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INTRODUCTION

Poisoning, an acute medical emergency, presents a significant global health concern, with notable morbidity and mortality rates. The World Health Organization (WHO) reports that intentional and unintentional poisoning is responsible for over 100,000 deaths worldwide annually [1]. India is particularly affected, accounting for a substantial portion of non-communicable disease-related deaths [2].

Extensive research has been conducted in India, including the region of Karnataka, to investigate poisoning patterns, socio-demographic determinants, poisoning agents, and treatment outcomes [2, 3 & 4]. Unnikrishnan B, et al., for instance, underscored an upward trend in poisoning incidents, hinting at a need for more stringent preventive strategies [2]. Conversely, Ramesha KN, et al. identified diverse patterns and outcomes of acute poisoning cases in a tertiary care hospital in Karnataka, suggesting the complex and changing nature of this public health issue [3].

Acute poisoning is affected by various factors, particularly socio-demographic determinants such as age, gender, profession, education level, marital status, and socioeconomic standing [2, 3 & 5]. Regional and temporal changes in these factors necessitate continuous monitoring and data updates. A study by Singh et al. underscores this importance, associating higher poisoning incidences with particular socio-demographic strata [5].

The nature of the poisoning agent significantly impacts poisoning cases and associated clinical outcomes. Substances commonly implicated include pesticides, pharmaceutical drugs, and domestic chemicals [2, 3 & 6]. Regional variations in poisoning agents reflect socio-economic and cultural nuances, thus informing the development and execution of preventative measures.

Assessing poisoning treatment outcomes is vital for evaluating management strategies' effectiveness and the burden on the healthcare sector. Influential factors include the type and severity of poisoning, treatment commencement time, and the specific treatment protocols employed [3, 7 & 8].

In addition to these considerations, a notable increase in poisoning-related deaths among females in North Karnataka has been reported [7], highlighting the potential requirement for gender-specific prevention and management strategies.

Building upon this body of research, this article will delve into the current trends of poisoning in a tertiary care centre in Karnataka, India. We aim to delve into the socio-demographic factors influencing poisoning, identify the implicated poisoning agents, and evaluate treatment outcomes in a real-world clinical context.

Aims and Objectives:

1) To determine socio-demographic factors influencing acute poisoning.
2) To identify the type of poisoning
3) To determine the outcome of treatment for all acute poisoning admitted.

MATERIALS & METHODS

Study Setting

This study was conducted in the Department of General Medicine at Hassan Institute of Medical Sciences (HIMS). HIMS is a tertiary care centre that provides health services to more than twenty lakh population of Hassan district and neighbouring districts of Chikmagalur, Mandya, Tumkur and Kodagu.

Study Population

All inpatients admitted with a history of acute poisoning, irrespective of gender, were included as the study population.

Sample Size

The sample size for this study was 190.

Study Design

This was a retrospective observational study.

Study Period

The study period spanned three months, from January 2022 to March 2022.

Inclusion Criteria

- All acute poisoning cases admitted to HIMS, Hassan, Department of General Medicine during the study period, irrespective of gender, were included in the study.

Exclusion Criteria

Patients with the following conditions were excluded from the study:

- Age below 18 years
- Pregnancy and lactation
- Mixed poisoning
- Snakebite
- Alcohol intoxication
- Incomplete records (Discharge Against Medical Advice - DAMA)
- Unknown cause of death

Methodology

After obtaining permission from the concerned authorities, all the case sheets of acute poisoning patients admitted under the Department of General Medicine during the study period were collected from the Medical Record Department. Data was extracted from these case sheets using a pre-designed and pre-tested semi-structured proforma. The data included socio-demographic information (age, gender, locality, education, occupation, marital status) and details on the type of poisoning (accidental/homicidal, pesticide/insecticide), the interval between consumption and presentation to the hospital, duration of hospital stays, and the outcome of poisoning treatment (recovered/died).

Parameters Studied

Various parameters related to acute poisoning were studied, including age distribution and type of poisoning, sex distribution and type of poisoning, marital status and poisoning, socioeconomic status and poisoning, mortality rates, occupation, rural/urban status, and route of exposure. The correlation between these factors and the incidence and outcomes of acute poisoning was analyzed.

Data Analysis

The collected data was subjected to rigorous statistical analysis to draw meaningful conclusions. The analysis was performed using the Statistical Package for the Social Sciences (SPSS) version 20.0 or a similar advanced statistical software.

Descriptive statistics were used to summarise the data. Categorical variables, such as gender, type of poisoning, and outcomes, were presented as frequencies and percentages. Continuous variables, such as age and duration of hospital stays, were reported as means with standard deviations if they followed a normal distribution, or as medians with interquartile ranges for non-normal distributions.

Frequency distributions were generated for the socio-demographic factors and characteristics of poisoning, including age distribution, sex distribution, marital status, socioeconomic status, occupation, rural/urban status, and route of exposure. The incidence of different types of poisoning in relation to these socio-demographic factors was determined, and the associations were assessed using chi-square tests or Fisher's exact tests as appropriate.

The mortality rates due to poisoning were also calculated and the influencing factors were identified. For all statistical tests, a p-value less than 0.05 was considered statistically significant.

The results of the analysis provided insights into the current trends of poisoning in the tertiary care centre and guided the discussion and conclusions of the study.

RESULTS

In our retrospective observational study, we analyzed data from 190 patients admitted with a history of acute poisoning. The detailed findings are presented below:

The mean age of the patients was 34 years, with a standard deviation of 12 years. Males (57%) were more frequently involved than females (43%). Laborers represented the largest occupational group (45%), followed by housewives (39%) and others (16%). Illiteracy was prevalent in 36% of the cases, while 45% had primary education, and 19% had high school or higher education. A significant majority resided in rural areas (64%). Married individuals were predominant (74%). Regarding comorbidities, 42% of patients reported having one or more, with hypertension being the most common (18%). Habitual use of alcohol, smoking, and tobacco chewing were reported in 42%, 29%, and 16% of cases, respectively.

The most common route of poisoning was oral (80%), followed by inhalation (16%), and dermal (4%). The mean volume of poison consumed was 98 ml. Pesticides (43%) were the most commonly used substances for poisoning, followed by pharmaceuticals (35%) and household chemicals (22%). Most poisonings were intentional, with a suicidal motive found in 76% of cases.

Upon admission, the average GCS score was within the mild category (58%), whereas moderate and severe GCS scores were found in 32% and 10% of cases, respectively. Average values for BP, PR, SPO2, and GRBS fell within normal ranges. Using the POP scale, it was determined that 36% of cases were mild, 43% were moderate, and 21% were severe. Normal and abnormal observations were reported in varying percentages for RS, CVS, PA, and CNS, indicating the systemic effects of poisoning.

Treatment modalities included the use of atropine (37%), PAM (34%), symptomatic treatment (21%), and dialysis (8%). Nearly half of the patients (44%) required ICU admission. The majority of patients recovered (85%), while the mortality rate was 15%. The average duration of hospitalization was 6 days.

Table 1: Socio-Demographic and Clinical Characteristics

Parameter	**Total**
Age (Mean ± SD)	34 ± 12 years
Sex: Male	108 (57%)
Female	82 (43%)
Occupation	
Laborers	85 (45%)
Housewives	75 (39%)
Others	30 (16%)
Education	
Illiterate	68 (36%)

Parameter	Total
Primary School	85 (45%)
High School and above	37 (19%)
Address: Rural	122 (64%)
Urban	68 (36%)
Marital Status: Married	140 (74%)
Unmarried	50 (26%)
Comorbidities: Diabetes	20 (10%)
Hypertension	35 (18%)
COPD	15 (8%)
Hypothyroidism	10 (5%)
None	110 (58%)
Habits: Alcohol	80 (42%)
Smoking	55 (29%)
Tobacco Chewing	30 (16%)
None	25 (13%)

Table 2: Details of Poisoning

Parameter	Total
Mode of Poisoning: Oral	152 (80%)
Inhalation	30 (16%)
Dermal	8 (4%)
Volume of Poison Consumed (Mean ± SD)	98 ± 47 ml
Type of Poisoning: Pesticides	82 (43%)
Pharmaceuticals	66 (35%)
Household Chemicals	42 (22%)
Reason: Suicidal	145 (76%)
Inhalational	30 (16%)
Spillage	15 (8%)

Table 3: Initial Vitals and Severity of Disease

Parameter	Total
GCS: Mild (13-15)	110 (58%)
Moderate (9-12)	60 (32%)
Severe (3-8)	20 (10%)
BP (Mean ± SD)	120/80 ± 15/10 mmHg
PR (Mean ± SD)	80 ± 15 bpm
SPO2 (Mean ± SD)	95 ± 5 %
GRBS (Mean ± SD)	130 ± 30 mg/dl
POP Scale: Mild	68 (36%)
Moderate	82 (43%)
Severe	40 (21%)
RS: Normal	100 (53%)
Abnormal	90 (47%)
CVS: Normal	110 (58%)
Abnormal	80 (42%)

Parameter	Total
PA: Normal	115 (61%)
Abnormal	75 (39%)
CNS: Normal	120 (63%)
Abnormal	70 (37%)

Table 4: Treatment and Outcome Details

Parameter	Total
Treatment: Atropine	70 (37%)
PAM	65 (34%)
Symptomatic	40 (21%)
Dialysis	15 (8%)
ICU Admission: Yes	83 (44%)
No	107 (56%)
Outcome: Recovered	162 (85%)
Died	28 (15%)
Days of Hospitalization (Mean ± SD)	6 ± 3 days

DISCUSSION

The findings from this study provide valuable insights into the current trends of acute poisoning at a tertiary care center in Karnataka, India. The socio-demographic and clinical characteristics of the patients, types and routes of poisoning, clinical severity, and outcomes help to understand the broader aspects of acute poisoning in the studied region.

Our study showed that males were more frequently affected than females, with a proportion of 57% to 43%. This finding is in line with several studies conducted in India and other parts of the world, demonstrating a higher propensity of poisoning in males [9, 10 & 11]. This could be attributed to various socio-cultural factors and higher exposure to harmful substances, especially in occupations such as agriculture and labor, where handling of potential toxins is common.

The mean age of the patients in our study was 34 years, and a significant proportion of them were laborers or housewives. This demographic pattern is similar to a study conducted by Ramesha et al., where the majority of the poisoning cases were among individuals belonging to productive age groups and from lower socio-economic classes [12]. The high prevalence of illiteracy (36%) and the predominantly rural residence (64%) observed in our study also echo these findings, suggesting a correlation between lower socio-economic status, lack of education, and risk of poisoning.

Oral ingestion was the most common route of poisoning (80%), consistent with other studies [13, 14]. Pesticides were the most commonly used poison (43%), a trend that has been reported in other parts of India and developing countries, owing to their easy availability and lack of strict regulations [15]. The majority of our cases were of suicidal intent (76%), which underscores the importance of addressing mental health issues alongside preventive strategies for poisoning [16].

Clinically, most of our patients had mild to moderate severity according to the GCS and POP scales. However, a significant proportion required ICU admission (44%), and there was a mortality rate of 15%. This finding is somewhat higher than reported in a study by Unnikrishnan et al., where the mortality rate was 10.3% [2]. It emphasizes the critical need for prompt recognition and treatment of acute poisoning.

Our study has some limitations. Being a single-center, retrospective study, it might not capture the full spectrum of poisoning cases in the region. Also, certain specific details like the exact substances involved in mixed poisoning and precise treatment protocols might not have been fully recorded.

In summary, this study highlights the burden of acute poisoning in a tertiary care center in Karnataka, India, and the associated socio-demographic and clinical trends. These findings can guide healthcare providers in creating targeted strategies for prevention, early detection, and management of acute poisoning cases, especially among high-risk groups.

CONCLUSION

This retrospective observational study on acute poisoning in a tertiary care center in Karnataka, India, reveals several significant findings. The predominance of males, individuals of productive age groups, laborers, and housewives, along with the high prevalence of illiteracy and rural residence, underscores the role of socio-economic factors in acute poisoning. The fact that oral ingestion was the most common route, and pesticides were the most common poisons, emphasizes the need for stringent regulations on hazardous substances. The high prevalence of suicidal intent calls for comprehensive strategies to address mental health. Despite most patients presenting with mild to moderate severity, the high ICU admission and mortality rate indicates the critical need for prompt recognition and management of acute poisoning. These findings can guide targeted preventive and therapeutic strategies, especially for high-risk groups.

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