

## Original Research Article

# Study of the pattern, intent behind and outcome of acute poisoning in a tertiary care centre

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## ABSTRACT

**Background:** Acute poisoning is one of the major medical emergencies with significant morbidity and mortality. Appropriate planning, prevention and management techniques can be designed by knowing the nature, severity and outcome of acute poisoning cases. Most of the poisoning is due to the intention of deliberate self-harm. This study aimed to study the pattern and outcome of acute poisoning and the intent behind poisoning.

**Methods:** This is a cross sectional study which included 100 acute poisoning cases in a tertiary care hospital. The study includes data regarding age, sex, time elapsed after intake of poison; name of the poisonous substance, duration of hospitalization, severity and outcome were collected in the prestructured proforma. Intent behind poisoning was calculated using Beck's suicide intent score.

**Results:** Incidence was more common among males (69%) but there was no significant correlation between gender and mortality. Mean age of presentation was 35.66 years but age of presentation and mortality correlation was not statistically significant ( $t=0.92$ ,  $p=0.3$ ). Organophosphorous compound poisoning (36%) was the most common type of poisoning. Total mortality was found to be 12%. Beck's suicide intent scores were higher in patients who died and statistically significant ( $t=8.96$ ,  $p=0.0001$ ). Maximum patients expired when there was a delay in admission to hospital by more than 8 hours after exposure.

**Conclusions:** Poisoning is more common in young males. The overall mortality depends on type of poison, time elapsed since exposure to hospital arrival, suicidal intent and many other factors. Early care in a tertiary care center may help to reduce mortality in India.

**Keywords:** Acute poisoning, Pattern and outcome, Tertiary care hospital, Beck's suicide intent score

## INTRODUCTION

Acute poisoning is one of the major medical emergencies with significant morbidity and mortality. Most of the poisoning is due to the intention of deliberate self-harm.<sup>1</sup> Accidental and occupational acute poisoning have been seen in farmers and children. The World health organization (WHO) have reported that around 0.3 million people die due to the various acute poisoning annually, out of which 200000 deaths are due to organophosphorous poisoning alone.<sup>2,3</sup>

The incidence is much higher in the developing and resource-limited countries. Agricultural pesticides (organophosphorous, organochloride, zinc, aluminum phosphide) are commonly used substances for intentional or accidental poisoning in Asian countries due to their easy availability while the misuse of the drugs (paracetamol, opioids, benzodiazepines, tranquilizers) is commonly seen in industrial and developed countries.<sup>4,5</sup>

The epidemiological factors such as geography, occupation, socioeconomic status, literacy rate, and

cultural and religious practices can influence the clinical presentation and outcome of the poisoning patients. This urges the need for periodical study for understanding the pattern of poisoning in a specific geographical area. Poisoning patients with the evidence of organ failure require admission to the intensive care unit (ICU).

Besides the type of poison, delayed presentation and multi-organ failure that require immediately advanced life support organ can lead to high mortality.<sup>6,7</sup>

However, little is known about the pattern of poisoning and there is a paucity of studies on the pattern of poisoning, epidemiological parameters and intent behind poisoning. Hence, this study was conducted with the objectives of evaluating epidemiological parameters, intent behind and outcome of acute poisoning in a tertiary care centre.

### Objectives

Objectives were to study the pattern of acute poisoning cases in a tertiary care centre and to assess intent in acute poisoning.

## METHODS

### Study design

This study was cross sectional type.

### Study area

The present study was conducted on patients admitted in Victoria and Bowring and Lady Curzon hospitals, affiliated to Bangalore Medical College and Research Institute, Bangalore.

### Inclusion criteria

Inclusion criteria were 1) age more than 18 years 2) patients/patient attenders who give written informed consent will be included in the study.

### Exclusion criteria

Exclusion criteria were 1) age less than 18 years 2) poisoning due to accidental exposure.

### Study population

Total 100 Cases admitted in Victoria and Bowring and lady Curzon hospitals under BMCRI.

### Study period

The duration of the study was May 2019-July 2019.

### Methodology of data collection

After obtaining ethical clearance and approval from the Institutional ethics committee of BMCRI, written informed consent will be taken from the patients. Data will be collected by semi structured questionnaire, clinical examination and investigations.

Data will be collected and analyzed of all the patients satisfying the inclusion and exclusion criteria.

For the purpose of the study the following operational standard criteria/definitions will be used: 1) questionnaire regarding basic demographic data, clinical history and examination 2) beck's Suicide Intent Scale will be used to assess the intent

The data collected will be entered in Microsoft excel and analysed by SPSS version 24.0 Data will be analyzed by descriptive statistics namely mean, median, standard deviation, percentages, tables and graphs wherever applicable, appropriate parametric and non-parametric tests will be used,  $p < 0.05$  will be considered statistically significant.

## RESULTS

A total of 100 patients of various poisoning cases were studied. Incidence was more common among males (69%) compared to females (31%). Mean age of presentation was 35.66. By occupation, 36% of the cases were manual laborers followed by housewives (26%), students (20%), farmers and unemployed (13%) and businessmen (5%). A majority of the poisoning cases (36.0%) were due to organophosphorus compound (OPC) followed by tablet consumption (19%), unknown compound (10%), aluminum phosphide (8%) and others (Figure 1). Tablets commonly used were phenytoin, paracetamol, thyroxine, amlodipine and mixture of tablets/capsules. Corrosives were phenol and kerosene. Total mortality was found to be 12%. Mortality rate was 100% among patients with paraquat poisoning followed by a mortality of 50% in aluminum phosphide (Table 1).

**Table 1: Pattern of poisoning and mortality.**

Compound	Number of patients	Mortality (%)
Organophosphorous	36	2(5.5)
Pyrethroid	8	0
Aluminium phosphide	8	4(50)
Zinc phosphide	5	0
Tablets	20	1(5)
Corrosive	10	0
Paraquat	3	3(100)
Unknown	10	2(20)

Paraquat poisoning had highest mortality followed by aluminium phosphide.

The mean age of presentation in those who died and who did not was similar and not statistically significant (t=0.92, p=0.3). Beck's suicide intent scores were higher in

patients, who died, statistically significant (t=8.96, p=0.0001) (Table 2).

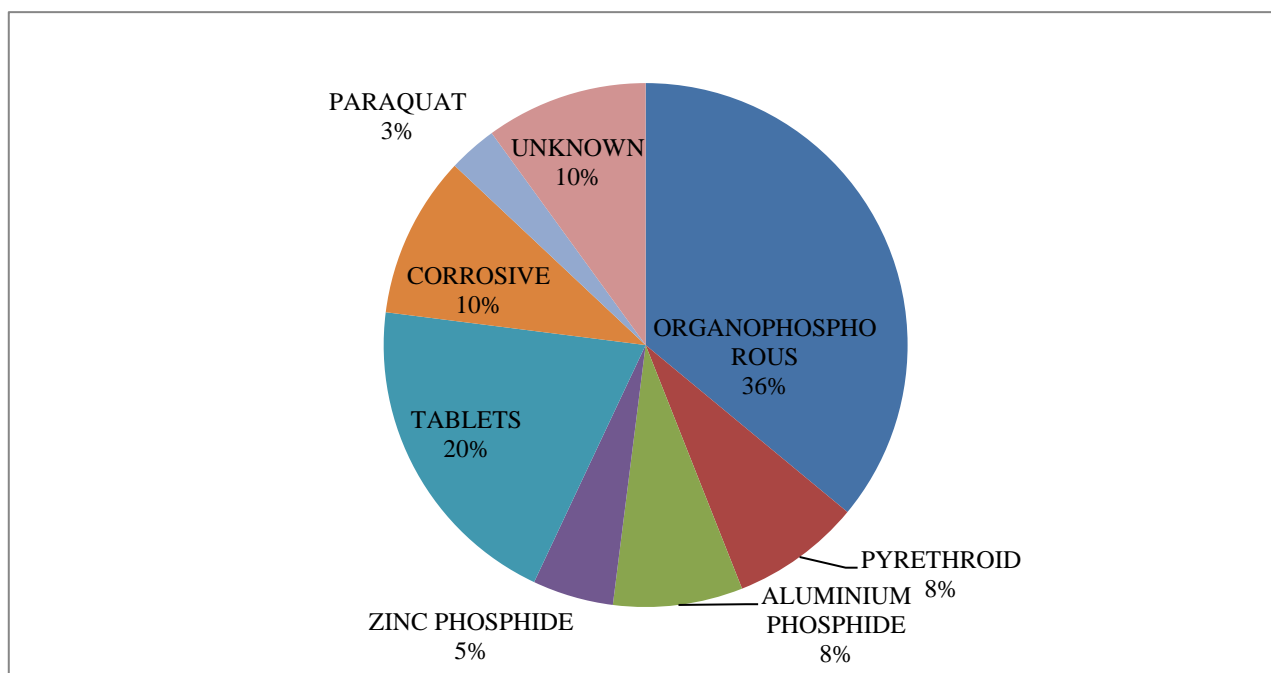


Figure 1: Pattern of poisoning.

Table 2: Comparison of parameters in poisoning with and without mortality.

	Mortality (N=12) [Mean±SD]	No mortality (N=88) [Mean±SD]	T value, p value
Age	35.66±12.33	32.19±12.17	T=0.92, p=0.3
Beck's suicide intent scale	31.91±3.19	22.95±4.37	T=8.96, p=0.0001**

\*\*p value<0.05 was statically significant. Those who died had significantly higher suicide intent scores

There were more males (69) as compared to females (31). Yet, there was no statistically significant relationship between gender and mortality (Table 3).

Table 3: Relationship between gender and mortality.

Gender	Total	Mortality	
Male	69	9	X2=0.02
Female	31	3	P=0.88

Table 4: Time elapsed since exposure to hospital arrival and mortality.

Time lapse(hrs)	Total cases	Mortality
<2	27	1(3.7%)
2-4	33	2(6.06%)
4-8	24	4(16.67%)
>8	16	5(31.25%)

Patients who presented early had less mortality

Maximum patients expired when there was a delay in admission to hospital by more than 8 hours after ingestion, followed by a time period of 5-8 hours.<sup>8,9</sup> Patients admitted within 2 hours of ingestion had the least mortality.<sup>10</sup> Median hospital stay was 4 days. Only 13 patients stayed in the hospital for more than 15 days (Table 4).

DISCUSSION

In the present study, organophosphorous compound poisoning followed by tablet consumption were the two most common types of poisoning. A retrospective study conducted in pgimer, Chandigarh showed organophosphorous poisoning followed by aluminium phosphide poisoning to be most common types of acute poisoning.<sup>11</sup> A prospective observational study at ICU of tertiary care hospital in Nepal for 2 years showed organophosphorous poisoning to be the most common acute poisoning.<sup>12</sup> A study conducted at the All India Institute for Medical Sciences, New Delhi, showed that drugs (18%) and insecticides (12.80%) are the most

common agents out of a total of 726 poisoning cases. Out of this insecticide group, carbamate (47) formed the largest

group followed by OPC (43) and organochlorine compounds.<sup>9</sup> This difference in the type of poisoning seen within the country may be due to the difference in the pattern of use and availability of pesticides.

In this study, mean age of presentation of the poisoning cases was 35.66 years. Similar findings were observed in other studies.<sup>9,13</sup> Present study revealed a higher incidence of poisoning in males compared to females. Similar male preponderance was found in studies conducted in Warangal and Tamil Nadu.<sup>14,15</sup> In contrast some other studies have shown that males are marginally higher compared to females and marginally more among females in others.<sup>16,17</sup> The male preponderance appears to be due to more exposure to occupational hazards, stress or strain and cultural patterns in this area and other studies. In this study, the overall mortality was found to be 12%. Similar data were also obtained by a study which reported an overall mortality rate of 17.3%.<sup>18</sup>

Other studies showed it as 3-4%.<sup>19,20</sup> Mortality in the present study is probably higher because study centre is a referral hospital in the state which caters to high number of poisoning cases with complications. Beck's suicide intent score was higher among patients who succumbed. It was found in our study that time lapse has a significant bearing on the total outcome. This is in comparison to a study by Agarwal et al where 190 cases of acute poisoning were studied.<sup>21</sup> The cross sectional-based nature and relatively small sample size are the limitations of our study.

## CONCLUSION

Overall, the current study has managed to contribute substantial additional information regarding the epidemiology and outcome of poisoning in a tertiary care hospital. Poisoning is more common in young males. The overall mortality is substantially high, mainly contributed by self-poisoning with insecticides and corrosives. Beck's suicide intent scale was higher among patients who succumbed. Timely transport and intervention of all critically ill poisoning cases is required to prevent the high mortality among victims. There is a need to investigate further the high mortality rates associated with poisoning.

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