

## A STUDY ON PATTERN OF ACUTE POISONING IN AN EMERGENCY DEPARTMENT OF A TERTIARY CARE HOSPITAL

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### ABSTRACT

**Objectives:** To study the sociodemographic, type of poisoning and mode of poisoning in an emergency department of a tertiary care hospital.

**Methods:** A retrospective, observational study of 12 months duration was conducted in a teaching hospital from January 2013 to December 2013. Data regarding demography, name of poisonous substance, were collected in the pre-structured form and analyzed using descriptive statistics.

**Results:** A total of 384 cases of poisoning were recorded. Among this incidence was more common in males (69%) compared to females (31%) with a ratio 2.22:1. Most of the cases of acute poisoning presented between 21 and 30 years age group (49.5%). The majority of cases were seen among rural people (64%), farmers (36.5%) followed by manual laborers (30.3%) were most commonly encountered. Suicidal tendency as a mode of poisoning accounted (73%). Most of the cases of acute poisoning were due to pesticides (62.8%) followed by snakebites (18.2%), drug overdosage (14.4%), corrosives (2.6%), and kerosene (2%). Among pesticidal poisonings most commonly encountered was organophosphorus (OP) (34.6%) followed by organocarbamates (11.3%), pyrethroids (10.8%), aluminum phosphide (3.5%), and rat poison (2.6%).

**Conclusion:** Poisoning was most commonly seen among OP compounds. So, proper educational and training interventions on pesticide handling and safety precautions, restriction on hazardous pesticides are needed to decrease pesticide exposure to farmers.

**Keywords:** Poisoning, Organophosphorus compound, Drug overdose, Snakebite.

### INTRODUCTION

The use of pesticides dates back to 1000 BC when sulfur was used as a fumigant. Over years advancement in the field of agricultural science saw newer and more effective pesticides with an equally higher toxicity profile. Currently, there are more than 25,000 pesticide formulations used worldwide. The organophosphate (OP) compounds were discovered around the 2<sup>nd</sup> world war by Schraeder [1]. These belong to the class of anticholinesterases and inhibit the enzyme acetylcholinesterase and butyrylcholinesterase. This results in over stimulation of the cholinergic system manifesting in the form of muscarinic, nicotinic, and central nervous system symptoms [2].

In many developing countries like India, deliberate self-harm is a major public health problem [3]. Every year 500,000 deaths occur in Asia due to self-harm. It is evaluated that 200,000 of these deaths are due to OP poisoning [4]. The easy availability of pesticides through unregulated, open local markets and lack of knowledge on the proper storing techniques and use of these lethal compounds contribute to the increasing number of self-harm due to pesticides [5].

Apart from OP compounds, there are other lethal compounds such as aluminum phosphide and pyrethroids, which are also used in poisoning. Drug overdose is the second most common mode of deliberate self-harm after poisoning with pesticides especially OP compounds [6]. Both poisoning and drug overdose are associated with a high case-fatality rate. In developing countries, this has been found to be 15 times higher than in developed countries [7].

Snakebite is also a major problem worldwide. According to estimates, more than 5 million venomous snakebites occur every year, and nearly 125,000 of those who suffer snakebite die, with the majority of the deaths occurring in the rural areas because of inadequate primary treatment and lack of tertiary care facilities [8]. The present study was conducted with the objective to investigate the pattern of acute poisoning cases in a teaching hospital in South India.

### METHODS

A retrospective, observational study of 12 months duration was conducted in a teaching hospital, Raichur Institute of Medical Sciences from January 2014 to December 2014. The Institutional Ethics Committee was approved before the study.

A pre-structured, pre-tested data have been collected from case record form regarding demographic profile, type, and mode of poisoning. Descriptive statistics was used to analyze the data.

#### Inclusion criteria

A suspected case of poisoning in patients aged 12-60 years of either sex and patients who are hospitalized for more than 24 hrs.

#### Exclusion criteria

All cases with food poisoning and allergic reactions to drugs.

### RESULTS

A total of 384 (male 265, female 119) cases were observed in the finding. Age of the cases ranged from 12 to 60 years. Most of the affected people were between 21 and 30 years age group (49.5%), 16.8% were found in 12-20 years of age group, and 23.4% were 31-40 years age group (Table 1). Sex incidence shows that most of the affected people were male 265 (61%) and 119 (39%) were female. Marital status shows that highest number 222 (57.8%) of the patients were married, 128 (33.3%) of were unmarried, and 12 (3.1%) were separated. The majority of cases were seen among rural people (64%).

In analysis of occupation of the victims, 36.5% were farmers, 30.3% were manual laborer, 13.4% were students, 11.1% were homemakers, and 8.7% were unemployed (Table 2).

About 25.8% of poisoning cases were illiterate, 25% were primary level, 11.5% were educated up to secondary level, and only 37.7% were above higher secondary level (Table 3).

Table 1: Age distribution of poisoning cases

Age (years)	Frequency N (%)
12-20	64 (16.8)
21-30	190 (49.5)
31-40	90 (23.4)
41-50	28 (7.3)
51-60	12 (3)

Table 2: Occupation of poisoning cases

Occupation	Frequency N (%)
Farmer	140 (36.5)
Manual labors	116 (30.3)
Students	51 (13.4)
Homemakers	43 (11.1)
Unemployed	34 (8.7)

Table 3: Education of poisoning cases

Education	Frequency N (%)
Illiterate	99 (25.8)
Primary	96 (25.0)
Secondary	44 (11.5)
High school	90 (23.4)
Pre-university	33 (8.6)
Degree	22 (5.7)

Most of the poisoning cases were suicidal with 73% tendency and 27% were accidental. Most of the accidental poisoning were due to snakebite. The majority of acute poisoning were due to pesticides (62.8%) second most common found snakebite (18.2%) followed by drug overdose (14.4%), corrosives (2.6%), and kerosene (2%) (Table 4). Among pesticides, 34.6% were due to OP poisoning, and paracetamol was the most common drug overdose.

## DISCUSSION

In the present study, pesticides were most common types of poisoning (62.8%) followed by snakebites (18.2%), drug overdose (14.4%), acid (2.6%), and kerosene (2%). Among pesticides, common compounds found were OP (34.6%), organocarbamate (11.3%), pyrethroids (10.8%), and aluminum phosphide (3.5%). Paracetamol (5.2%) was the most common drug overdose followed by benzodiazepines (4.1%), opioids (3.1%), and chlorpheniramine (2%).

In a previous retrospective study from South India, OP compounds were reported as the most common cause of poisoning (36.0%). Snakebite (16.2%) being the second most cause followed by drugs (11.0%), rat poison (7.3%), and others [9]. Another study from North India also reported OP compounds and celphos as the most common poisonings although a majority (76.60%) were unknown poisonings [10]. OP compounds were also implicated in 68.7% of the total poisoning-related fatalities in another study [11].

Similar to our study, few other studies also showed that most commonly used poisoning substances were OP compounds [12-14]. Contrary to study at the All India Institute for Medical Sciences, New Delhi, which showed carbamate (47%) followed by OP compound (43%) and organochlorine compounds as the most common types of poisoning [15]. The difference seen in the type of poisoning within the country could be due to the difference in the pattern of use and availability of pesticides.

Table 4: Pattern of poisoning

Poisoning	Frequency N (%)
Pesticides	241 (62.8)
OP	133 (34.6)
Organocarbamates	43 (11.3)
Pyrethroids	41 (10.8)
Aluminum phosphide	14 (3.5)
Rat poison	10 (2.6)
Snakebite	70 (18.2)
Drug overdose	55 (14.4)
Paracetamol	20 (5.2)
Benzodiazepines	16 (4.1)
Opioids	12 (3.1)
Chlorpheniramine	7 (2)
Acid	10 (2.6)
Kerosene	8 (2)

OP: Organophosphorus

In this study, the majority of the poisoning cases were presented between 21 and 30 years age group (49.5%). Few other studies with similar findings were observed in Unnikrishnan *et al.* Das, and Dash *et al.* studies [13,15,16]. Males dominated the present study with male to female ratio of 2.2:1. However, some other studies also shown that males are marginally higher compared to females [16,17] and marginally more among females in others [18,19]. This high proportion of poisoning in males could be due to lifestyle changes and cultural patterns in the area.

The domicile distribution of poisoning cases in our study showed 64% from rural areas comparable to other studies [13]. The majority of the patients (73%) consumed the poison with suicidal intent as compared with 27% of the patients exposed accidentally. A study done in Kathmandu (16-65 years age group) shows that 97% of the cases admitted were due to suicidal attempt [20]. However, this study did not include snakebite cases unlike in our study. In contrast, a study done at New Delhi reported that nearly half (47%) of poisoning cases were accidental (1-70 age group) [17].

Legislative measures to enforce the use of pesticides with low human toxicity and slow onset of action, reducing the bottle size and pesticide concentration might be helpful in decreasing the associated mortality burden. Implementation of integrated pest and vector management practices will decrease pesticide use in rural communities and, therefore, reduce their availability for self-harm. Furthermore, steps can be taken to educate public about pesticide use and its harmful effects on body systems. Besides, there is a continuous need to provide a more locally available and affordable hospital care at community level.

## CONCLUSION

Acute poisoning is a most common and urgent medical problem in our country. The present study managed to contribute substantial additional information regarding the pattern of poisoning and its sociodemographic factors. The pattern of poisoning is thus multidimensional and multisectoral approach for facing the problem. People who are engaged in medical practice must be aware of the pattern of common poisoning agents and their management.

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