

## ORIGINAL ARTICLE

# A Descriptive Clinical Study of Acute Poisoning Cases Admitted in a Tertiary Care Hospital

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## Abstract

**Background:** Poisoning is a major public health problem and due to industrialization and urbanization, its incidence is on a major rise and it may be poisoning, suicidal, accidental, or homicidal. It is extremely important for physicians to have the knowledge of common suicidal poisons in a particular locality as it may help in the early diagnosis and management of acute poisoning cases. Therefore, this study was conducted to know the clinical spectrum of acute poisoning cases in and around Mangaluru and the effectiveness of decontamination procedures.

**Methods:** 100 patients admitted in the intensive care units and wards of the General Medicine department were observed in this study. Details of each of these patients like presenting complaints, time of onset of the symptoms, addictive habits, and the nature of poisons consumed were noted. Clinical parameters such as whether stomach wash was given or not, the time lapse between the consumption of poison and stomach wash, the time lapse between the consumption of poison and stomach wash and death of the patients, duration of hospital stay, psychiatric condition of the patient and overall mortality rate of poisoning cases, were observed in this study.

**Results and Conclusion:** The present study shows that organophosphate poisoning is the commonest type of poisoning. Nausea or vomiting is the most common symptom. There is a significant correlation between the time elapsed between the consumption of poison and stomach wash and mortality. Mortality was highest in patients with paraquat poisoning followed by rat poisoning.

**Keywords:** descriptive, acute poisoning, tertiary, hospital

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## INTRODUCTION

Poisoning is a major public health problem and due to industrialization and urbanization, its incidence is on a major rise. In recent times, a significant number of new compounds have been produced that are poisonous substances as a part of development in the fields of agriculture, medicine, and industries. It has been estimated by the WHO that about 3 million cases of poisoning have been reported worldwide, the majority of them being in developing countries [1]. It is known that self-poisoning is the most common way of attempting or committing suicide [2]. In developing countries, the case fatality rate of self-poisoning has been estimated to be 10-20%, but for particular pesticides, the case fatality rate is up to 50-70%. On the contrary, the case fatality rate of self-poisoning in Western countries is less than 0.3%. The etiology of the increased case fatality rate in developing countries is because of multiple factors. Some of the factors are locally available poisons being highly toxic, increased time latency between ingestion of poisons and reaching the hospital, the less number of health care workers compared with the enormous number of patients, and the lack of

facilities, antidotes, and training for the management of pesticide-poisoned patients [3].

India does not have a central poison registry, therefore the exact incidence of poisoning cases is not known. The common toxins involved in acute poisoning cases are different in different places. Common poisoning cases in Western countries are due to medicinal agents. On the contrary, insecticides and pesticides are the most commonly consumed poisons in India. Moreover, many cases of drug overdose have been reported in India over the last decade. Besides these poisonous agents, plant poisons contribute to a significant proportion of commonly used poisons used in the southern part of India [3].

Acute poisoning is a medical emergency and the poisoning may be suicidal, accidental, or homicidal. Organophosphates are one of the widely used suicidal poisons as they are easily available and relatively cheaper [3]. It is extremely important for physicians to have the required knowledge of common suicidal poisons in a particular locality as it may help in the early diagnosis and management of acute poisoning cases. Hence, the present study was conducted to know the clinical spectrum of acute poisoning cases in and around Mangaluru and the

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effectiveness of decontamination procedures.

## METHODS

This is a descriptive observational study carried out in the intensive care units and wards of the Medicine Department, Kasturba Medical College Mangaluru, and Government Wenlock District Hospital, Mangaluru. The study was carried out for a period of two years. The institution's ethics committee approval was received before initiating the study.

### Sample size:

100 patients admitted in the intensive care units and wards of the General Medicine department, Kasturba Medical College, Mangaluru, and Government Wenlock District Hospital, Mangaluru with various poisonings were observed in this study.

### Inclusion criteria:

Patients, who were admitted with various poisonings such as organophosphate, organochlorine, carbamates, rodenticides, any other drugs, copper sulphate, kerosene or other petroleum products, and heavy metals, which includes suicidal, homicidal, or accidental were included in this study.

### Exclusion criteria:

Patients, who presented with snakebite poisoning and scorpion bite poisoning and the patients, who were brought dead to the hospital were excluded from the study.

### Methodology

A total of 100 cases were studied. Details of each of these patients like presenting complaints, time of onset of the symptoms, addictive habits, and the nature of poisons consumed were noted. Clinical parameters observed and noted are whether stomach wash was given or not, the time lapse between the consumption of poison and stomach wash, the time lapse between the consumption of poison and stomach wash and death of the patients, duration of hospital stay, psychiatric condition of the patient and overall mortality rate of poisoning cases. All these patients were completely followed up from admission until recovery/death.

## RESULTS

### Nature of poisons consumed

It was observed that poisoning with organophosphate compound was most common among the commonly consumed poisons. (Table 1)

### Addictive Habits

The results showed that 50 percent of patients had addictive habits among which most of them were males. Likewise, 29% of the patients were both addictive to alcohol and smoking. Moreover, 25% of patients mixed poison with alcohol and then consumed the poison. (Table 2)

### Time of onset of symptoms

It was found that 61% of patients developed symptoms within 15 minutes of the consumption of poison. (Figure 1)

### Symptoms observed

It was observed that nausea or vomiting was the most common symptom present in the majority (96%) of the study population followed by a burning sensation in the

epigastric region (63%). (Table 3)

### Stomach wash

Table 1. Nature of poisons consumed

Nature of poisons	Number of cases
Carbamate (Carb)	6
Copper sulphate (CuSO <sub>4</sub> )	8
Diesel	1
Drugs	9
Kerosene	2
Organochlorine (OCL)	1
Organophosphate (OP)	54
Others	1
Paraquat	2
Petrol	1
Phenol	3
Rodenticide	12

Table 2. Percentage of patients with various addictive habits

HABITS	Percent
Alcohol	14.0
Alcohol +Smoking	29.0
Alcohol +Tobacco chewing	2.0
No habits	50.0
Smoking	2.0
Tobacco chewing	3.0

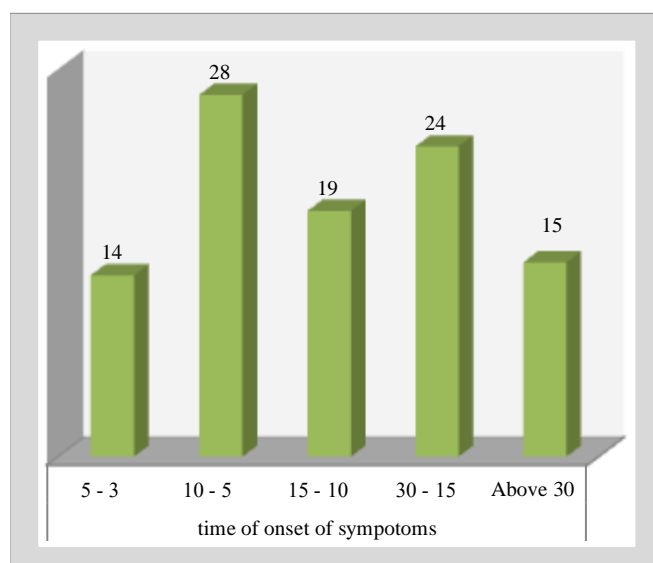


Figure 1. Time of onset of symptoms

Stomach wash was not done in seven patients out of which four patients consumed hydrocarbons and three patients consumed drugs and presented late. The remaining patients received stomach wash.

#### Time lapse between the consumption of poison and stomach wash

The majority of the patients in the study (76%) received stomach wash within two hours of the consumption of poison either in our study hospital or at a peripheral hospital and then referred to a higher center for further management. (Table 4)

#### Time lapse between the consumption of poison and stomach wash and death of the patients

Two hours were taken as the cut-off point for time-lapse and stomach wash. Mortality was analyzed for patients, who received stomach wash within 2 hours of the consumption of poison and after 2 hours. The percentage of mortality in patients, who received stomach wash early was very low (5.6%) compared to patients, who received stomach wash after 2 hours (77.3%). Chi-square test was

applied which showed a significant correlation between time-lapse and mortality ( $p < 0.001$ ). (Table 5)

#### Hospital Stay

In the present study, 47% of patients had a stay of 5-8 days while 29% of patients had a stay of 1-4 days.

#### Psychiatry workup

Of the total 100 patients, 79 patients underwent psychiatric analysis. The remaining patients died. Reactive depression was the most common diagnosis (49.3%). Dysthymia / major depression was present in (10%) of the cases past history of psychiatric illness was present in 7 cases. 32% of poison cases do not have any psychiatric problems.

#### Overall mortality Rate

The overall mortality rate in the present study was 21%. When the mortality rate for individual poison was calculated, the highest mortality rate was found with paraquat poisoning in which the mortality was 100%, and rat poison with a mortality rate of 41.7%. The mortality rate in organophosphorus poisoning was 22.2% and in carbamate and copper sulphate poisoning, it was 16.7% and 12.5% respectively. There was no mortality in hydrocarbon, phenol, and poisoning due to various drugs.

Table 3. Symptoms observed

Symptoms	Percent of patients
Nausea/Vomiting (N/V)	96
Heartburn (HB)	63
Abdominal pain (ABDP)	40
Jaundice	7
Drowsiness	21
Altered sensorium	12
Unconsciousness	6
Dyspnoea	5

Table 4. Time lapse between the consumption of poison and stomach wash

Time lapse	Frequency
Below 1hr	19
1 - 2hrs	52
2 - 3hrs	12
Above 3hrs	10

Table 5. Time lapse between consumption of poison and stomach wash and death of the patients

Time	No. of patients	No. of Patients expired	% of Mortality
< 1 hr	19	1	5.3
1-2 hr	52	3	5.8
2-3 hr	12	9	75
> 3hr	10	8	80

## DISCUSSION

#### Poisons consumed

In the present study, the most commonly consumed poisons were organophosphorus poison followed by rat poison. One such study done at PGI Chandigarh has reported that the most commonly used poisoning agents were agrochemicals like organophosphates and aluminum phosphide poisoning [4]. On the contrary, in many international studies, it was seen that various drugs were commonly used as agents for deliberate self-poisoning [5, 6, 7]. In our country, organophosphates and rat poison are easily available compared to drugs like benzodiazepines and barbiturates. Moreover, benzodiazepines and barbiturates are inaccessible to patients without a prescription from a medical practitioner.

#### Clinical presentation and treatment

Out of 100 patients, 96 patients presented with nausea and vomiting as the most common presenting symptom followed by a burning sensation in the epigastric region seen in 63 patients and abdominal pain seen in 40 patients. The common presenting symptoms of organophosphate poisoning are salivation, and vomiting followed by altered sensorium [8]. A total of 60 cases of organophosphorus and carbamate were present in the study population out of which only 17 patients had miosis at the time of presentation, the reason being the remaining patient had received atropine prior to admission to our hospital.

In the present study, a total of 49 patients received care in intensive care units of which 17(34.7%) patients expired. There was a mortality rate of 100% in those who were mechanically ventilated in the present study. Respiratory failure was the main cause of death in patients from organophosphorus poisoning. Respiratory failure was the cause of death in 75% of the patients, who died with poisoning. Aspiration pneumonia was observed in 25% of

the patients, who died from organophosphate poisoning.

In cases of organophosphate poisoning, the treatment mainly consisted of complete atropinization through continuous intravenous infusion. Injection pralidoxime was given along with symptomatic treatment and monitoring of vital signs.

Paraquat poisoning had the highest mortality (100%) among all poisons and these cases had severe metabolic acidosis, acute renal failure, and acute respiratory distress syndrome along with deranged liver function tests. Rat poisoning cases had 41.7% mortality and the majority of them presented with fulminant hepatic failure. Fresh Frozen Plasma was administered to these patients. Symptomatic treatment was provided to patients with poisoning due to drugs.

#### Hospital Stay

In the present study, 47% of patients had a stay of 5-8 days while 29% of patients had a stay of 1-4 days. Another study done on poisoning patients reported that the mean stay in the hospital was 2.9 days [9]. The majority of the patients in the study were of organophosphorus poisoning which required atropinization, intensive monitoring, and a much longer time to tide over the complications. Time elapsed between the consumption of poison and stomach wash and mortality. In the present study, the majority of patients, who received stomach wash within 2 hours of the consumption of poison survived. Mortality in patients, who received stomach wash early (within 2 hours) was very low (5.6%) compared to patients, who received stomach wash after 2 hours (77.3%). So there is a statistically highly significant correlation between the time elapsed between the consumption of poison and stomach wash and mortality ( $p < 0.001$ ).

#### Psychiatry workup

Of the total 100 patients, 79 patients, who survived underwent psychiatric analysis. Reactive depression was the most common diagnosis (49.3%). Dysthymia / major depression was present in 10% of the cases. Past history of psychiatric illness was present in 7 cases. Past history of suicidal attempts was absent in all the cases. In this study, 32% of poison cases did not have any psychiatric problems. History of alcoholism was present in 45 patients and alcohol dependence syndrome was diagnosed in 4 patients. Previous study has mentioned that 10% of patients with suicidal poisoning were diagnosed with depressive illness [9]. Another study showed that 20% of suicidal poisoning cases have had formal psychiatric treatment previously [5]. Yet another study reported that among the patients admitted with suicidal poisoning, 52% patients had neurotic depression, 29% had personality disorders, and 12% had functional psychosis [7].

#### Mortality rate

The overall mortality rate in the present study was 21%. A similar study done on poisoning reported 26.06% mortality [4]. Another study done at Orissa showed an overall mortality of 20.26% [10]. The mortality rate in the present study is higher because KMC Mangalore and Wenlock District Hospital are tertiary care centers and the majority of cases are referred cases from peripheral hospitals

and were in critical condition at the time of presentation. Another factor that would have contributed to high mortality could be the increased incidence of paraquat and rat poisoning compared to other studies. Mortality in acute poisoning is inevitable but various strategies need to be put into action in order to bring down the overall mortality. Better facilities and first aid at the primary care level go a long way in reducing mortality. Every district hospital must have a full-fledged poison information center and must be equipped with modern diagnostic and treatment facilities. General public education in relation to the hazards of chemicals, insecticides, rodenticides, and other drugs is necessary to achieve large-scale community prevention.

### CONCLUSION

The present study shows that organophosphate poisoning is the commonest type of poisoning followed by rat poisoning. Nausea or vomiting was the most common symptom present in poisoning followed by a burning sensation in the epigastric region and abdominal pain. There is a significant correlation between the time elapsed between the consumption of poison and stomach wash and mortality. The study showed that 50 percent of patients had addictive habits and most of them were males. On psychiatric analysis, it was found that the most common diagnosis was adjustment disorder with a brief depressive reaction. Mortality was highest in patients with paraquat poisoning followed by rat poisoning. The overall mortality rate in the present study was 21%.

### LIMITATIONS

The clinical history was used to determine the types of toxins involved in the study. No toxicological screening was done.

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