

## Profile of acute poisoning cases at a tertiary care hospital

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### Abstract

**Background:** Acute poisoning is a medical emergency. It is important to know the nature, severity and outcome of acute poisoning cases in order to take up appropriate planning, prevention and management techniques.

**Objective:** This study is aimed to assess the pattern and outcome of acute poisoning cases in a tertiary care hospital in Karnataka.

**Materials and Methods:** This is a retrospective hospital record-based study conducted in a tertiary care hospital attached to a medical institution in Karnataka from August 2011 to July 2012. The study included 104 cases and data regarding age, sex, time elapsed after intake; circumstances of poisoning, name of the poisonous substance, chemical type, severity and outcome were collected in the prestructured proforma.

**Results:** Incidence was slightly higher among males (52.9%) compared to females (47.1%). Most cases of acute poisoning presented among 20- to 29-year age group (49%) followed by <20-year age group (19.2%). A majority of poisoning cases (41.3%) were due to organophosphorus compound (OP). Total mortality was found to be 10. Suicide by poisoning was the most common (93.26%) mode of poisoning for both male and female, while accidental poisoning was 6.74%.

**Conclusion:** Poisoning is more common in young individuals. The overall mortality is substantially high, mainly contributed by self-poisoning with pesticides. Early care in a tertiary care center may help to reduce mortality in India.

**Keywords:** acute poisoning, organophosphorus, suicide

### Introduction

Acute poisoning is a common medico-social problem now a day all over the world. It consumes not only the valuable health service resources but also cause considerable morbidity and mortality. Deliberate self poisoning carries a high risk of death and puts immense strain on the emergency services of any hospital. Deliberate ingestion of pesticides has become one of the commonest methods of suicide globally. It is estimated that nearly 3 million people suffer from pesticide poisoning and almost 300,000 people succumb to it, accounting for about one-third of the world's suicides[1,2]. Organophosphorus pesticides are one of the most important causes of poisoning in the southern part of India, as also in many other parts of the country, as well as other

developing countries[3,4]. The nature of poison used varies in different parts of the world and may vary even in different parts of the same country depending on the socioeconomic factors and cultural diversity. Management of these critically ill patients will greatly improve if the common causes of poisoning are properly defined [5]. It is important to know the nature and severity of poisoning in order to take appropriate preventive measures. Studies of this nature will be a useful tool in planning and management of acute poisoning cases. In this context the present study was carried out with the objective to investigate the pattern of acute poisoning cases in a tertiary care hospital.

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## Materials and methods

This retrospective hospital record-based study was conducted in a tertiary care hospital attached to a medical institution in Karnataka from August 2011 to July 2012. The study included 104 cases of various acute poisoning due to drugs and chemicals in people above the age of 12 years. But cases with food poisoning and allergic reactions to drugs were not included in the study. Data regarding age, sex, time elapsed after intake; circumstances of poisoning, name of poisonous substance, chemical type, duration of hospitalization, severity and outcome were collected in the prestructured proforma. Circumstantial evidences such as empty bottles and tablets were also collected from the patients. Data was collected for general physical examination and systemic examination of the patient. The data collected was entered in the computer database. Analysis was done by using SSPS-15.

## Results

A total of 104 patients of various poisoning cases were studied. Incidence was slightly higher among males (52.9%) compared to females (47.1%). Most cases of acute poisoning presented in the age group between 20 and 29 years (49%) followed by <20-year age group (19.2%) and the frequency declined as the age advanced (Table 1). By occupation, 31.73% of the cases were agriculturists followed by students (28.84%), housewives (22.11%), and job holders (10.5%) and businessmen (6.73%) (Table 2). The study found that the number of married subjects were 52.9% and 47.1% patients were unmarried. Most of the patients were from urban area (57.6%) compared to rural area (42.4%).

Suicide by poisoning (93.26%) was the most common mode of poisoning for both male and female, while accidental poisoning was 6.74%. Among the suicidal mode of poisoning, 49.48% from the age group of 20–29 years followed by 19.58% in both age groups of 30–39 years and <20 years group was seen. The commonest agents involved in the poisoning was agrochemicals, maximum poisoning was due to organophosphates (41.3%) followed by corrosives (11.5%) organochlorines (10.5%) and sedatives (10.5%). The others category included ingestion of naphthalene ball, silicone gel, cannabis and drug overdose (DO) with the ophylline, glibenclamide, anti tubercular drugs, dichoral and multiple tablet/capsule

overdose. Results revealed that mortality due to poisoning was 9.61% of patients, the majority 6 (60%) were due to organophosphates followed by 10% each in organochlorines, rat poison, aluminium phosphide and paraquat. Among the deceased, none of the patients arrived at hospital on or before 3 hours and more than half of the victims arrived at hospital after 3 hours. While among the living patients, more than 64% arrived at hospital on or before 6 hours.

## Discussion

Of the 500,000 deaths occurring every year, nearly 200,000 deaths are due to self-poisoning with OP compounds in South East Asia. Data from the western part of the globe shows that DO is a common mode of deliberate self-harm<sup>6</sup>. The results of the present study show that OP poisoning and DO persist to remain a major public health problem. The last quarter of the 20th century saw tremendous advances in the fields of agriculture, industrial technology and medical pharmacy. These advances have paralleled changes in the trends of acute poisoning in developing and developed countries. Self-poisoning is one of the oldest methods tried for committing/attempting suicide. The mortality/morbidity in any case of acute poisoning depends upon number of factors such as nature of poison, dose consumed, level of available medical facilities and the time of interval between intake of poison and arrival at hospital, etc.

The results of our study illustrate that a total 104 patients were hospitalized due to acute poisoning in the hospital. Of these 10 (9.61%) patients died due to acute poisoning. The findings of the present study agree with various reports from developing and developed countries, which reveal a considerable increase in mortality and morbidity due to acute poisoning[5,7-10] The findings of the present study revealed a slightly higher incidence of poisoning in males than in females in all age groups corroborating with other studies[5,7,8]. There are findings of the some different countries where there is female preponderance [9,10]. The majority of incidences in males and females were from the age group of 20–29 years. The male preponderance appears to be due to more exposure to occupational hazards, and stress or strain as compared to females in this part of the world.

The present study revealed that self-poisoning (suicidal 93.26%) is the most common mode of acute poisoning followed by accidental (6.744%).

The similar observations made by other researchers[1,11-14]. The increase in number of self-poisonings may be due to many factors such as increases in unemployment, urbanization, break up in family support system and economic instability. Suicide attempts among young adults especially in age group of 20–29 years followed by age groups of <20 and 30–39 years could be due to lack of employment, break-up in the family support system, failure of love affair, an individual's frustrations, inadequacy to cope with some immediate situation, impulsive behaviours, stress due to job and family etc.

The morbidity and mortality due to acute poisoning has been mainly due to agrochemicals, which appear to be a by-product of the "green revolution" in South Asia [15,16]. There are few published studies of agrochemical poisoning in developed countries. A review of pesticide poisoning deaths in England and Wales found that pesticides were responsible for only 1.1% of poisoning deaths over a 44-year period[17]. The present study revealed that the maximum cases of self-poisoning was due to organophosphate pesticides, which is different from the results of North Indian studies. In North India, the majority of poisoning was due to aluminium phosphide [5,7,8,18]. Drugs mainly sedatives were the second most preferred agents for poisoning in our study. This is similar to the report of the other researchers [2,11,19].

We observed 10% (n=12) mortality in our study, and this death rate was comparable to other studies done in the Karnataka state by other researchers [1,11,20]. Highest mortality was in those who consumed agrochemical poisons. Many other studies on poisons have shown similar results [19,21]. Among the agrochemical poisons, organophosphorus pesticides resulted in maximum deaths (60%, n=6). Several studies have concurred with this observation [18]. This may be because of easy availability, and uncontrolled sale and use of these agents.

Among the total death, reported majority of them arrived at hospital after 3 hours. There was no mortality in those who arrived early, i.e., within 3 hours of poisoning. The reason for delay could be long distance or primary treatment at local hospital or clinic before referred to this hospital. Those patients (75% of total poisoning cases) who reached hospital at early hours within 3 h managed properly and discharged from the hospital after successful treatment. If treatment is delayed the initial peak blood level of poison may induce irreversible tissue damage to the organs, but death may not occur immediately. Death may then ensue from the damage already initiated. Delay in transfer of the patients from remote places to hospital lead to delay in treatment, which may cause to more damage the organs and lead to death. There are some reports showed that the delayed admission might be a factor for high mortality rate in cases of poisoning [22-24].

**Table 1. Distribution of patients by their age, sex and mode of poisoning**

Age(years)	Male		Female		Total
	Suicidal	Accidental	Suicidal	Accidental	
< 20	6	1	13	0	20
20-29	24	2	24	1	51
30-39	12	0	7	0	19
40-49	3	1	2	0	6
50-59	4	0	1	0	5
> 60	0	2	1	0	3
Total	49	6	48	1	104

**Table 2. Distribution of patients according to occupation**

	Male	Female	Total
Student	13	17	30
Housewife	0	23	23
Agriculturist	27	6	33
Business	7	0	7
Jobholders	8	3	11

**Table 3. Distribution of patients according to nature of poison and mortality**

No of hours	Non expired	Expired	Total
< 3	18	0	18
3-6	37	4	41
6-12	22	4	26
>12	10	1	11
Undetermined	7	1	8

**Table 4. Distribution of patients by the intervals between intake of poison and arrival at hospital**

Nature of poison	No of patients	Accidental	Suicidal	No of deaths
Organophosphate	43	2	41	6
Organochlorine	11	1	10	1
Pyrethroids	2	0	2	0
Corrosives	12	2	10	0
Sedatives	11	1	10	0
Rat poison	4	0	4	1
Aluminium phosphide	1	0	1	1
Paraquat	1	0	1	1
Others	13	1	12	0
Unknown	6	0	6	0

## Conclusion

The retrospective record-based nature and relatively small sample size are the limitations of our study. Some of the information such as time lapse for some patients, miscellaneous poisoning, prior alcohol consumption and state of stomach(full/empty) were not there in the records for analysis. Overall, the current study has managed to contribute substantial additional information regarding the epidemiology and outcome of poisoning in a tertiary care hospital at a district level. Poisoning is more common in young males and females. The overall mortality is substantially high, mainly contributed by self-poisoning with insecticides and corrosives. Timely transport and intervention of all critically ill poisoning cases is required to prevent the high mortality among victims. Educational and legislative interventions may be required to make the changes. There is a need to investigate further the high mortality rates associated with poisoning.

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