

Clinico-epidemiological profile of acute poisoning cases admitted in a rural tertiary care hospital of Maharashtra

Vinod Limbanath Vedpathak¹, Harshal Nutanrao Pise², Pramod Kharade¹

¹Department of Preventive and Social Medicine, SRTR Government Medical College, Ambajogai, Beed, Maharashtra, India, ²Department of Pharmacology, SRTR Government Medical College, Ambajogai, Beed, Maharashtra, India

Correspondence to: Vinod Limbanath Vedpathak, E-mail: vedvinod.l@gmail.com

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ABSTRACT


Background: Acute poisoning from occupational, accidental, and intentional exposure is a leading public health problem of the developing countries. Pattern of poisoning varies from country to country and region to region depending on various factors. Periodic epidemiological studies are necessary to understand the pattern of poisoning in each region. There is a lack of data regarding clinico-epidemiological profile of acute poisoning cases in our region. **Objectives:** The aim of this study was to explore the pattern of acute poisoning cases and to study the sociodemographic determinant and clinical outcome of victims of acute poisoning. **Materials and Methods:** This was a prospective, cross-sectional, hospital-based study carried out from June 2013 to May 2014. All poisoning cases admitted during the study period to the emergency ward and intensive care unit medicine ward were included in the study. Relevant epidemiological and clinical data from the patients were collected and analyzed. **Results:** A total of 142 cases of acute poisoning were included in the study. Males accounted for 62.67% of the total cases and most of the victims of acute poisoning were from rural area, i.e., 77.46%. Majority of patients, i.e., 43.67% were farmers by occupation. The most common age group involved was between 20 and 40 years. Majority of them, i.e., 76.76% were married. Majority of them were belonging to low socioeconomic class. Suicidal poisoning was common, i.e., 57.74%. Organophosphorous compounds were the most commonly preferred poison (67.60%). In the present study, >84% of cases reached the hospital within 3 h of exposure. Mortality rate of 11.26% was noticed in the present study. **Conclusion:** The present study concludes that acute poisoning is an alarming public health problem in this region. It affects the larger number of young male population, particularly farmers. The predominant mode of poisoning was suicidal and organophosphate (OP) compounds were the preferred poison. It is essential to strengthen the legislature on the availability of OP compounds.

KEY WORDS: Clinico-epidemiological Profile; Acute Poisoning; Compounds Organophosphorous; Pesticides

INTRODUCTION

Poison is a substance that causes damage/injury to the body and endangers one's life due to its exposure by means of

ingestion, inhalation, or contact.^[1] Acute poisoning from occupational, accidental, and intentional exposure is a leading public health problem of the developing countries.^[1] In developed countries, mortality from poisoning is 1-2%, but in India, it varies between 15% and 30%. Poisoning is the fourth most common cause of mortality in rural India.^[2] According to data from the National Crime Bureau of India, poisoning accounted for 7.50% of all cases of unnatural deaths in the year 2007. It has been estimated that in India 5-6 persons/lakh population die due to acute poisoning every year.^[3,4] Rapid industrialization and massive use of pesticides in agriculture have increased

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the incidence of poisoning. There is a rapid progress in the industrial and agricultural fields and advances in medical sciences with which a vast number of insecticides have become available, which on exposure may produce severe toxicity.^[5] The studies indicate that proportion of acute poisoning cases is not concordant with the volume of pesticides sold in each region, but it is the pattern of pesticide use and the toxicity of the products, not the quantity used, that influence the likelihood that they will be used in acts of fatal self-harm.^[6]

Pattern of poisoning in particular region depends on various factors such as availability and access to poison, their proper uses, and sociodemographic status of an individual. Several studies done in India have shown organophosphates (OPs) as the most common agents of poisoning.^[5-8] Some recent studies have found change in the trends of poisoning in certain parts of India with an increasing incidence of poisoning with aluminum phosphate.^[9,10] Furthermore, periodic epidemiological studies are necessary to understand the pattern of poisoning in each region. Studies of this nature act as a useful planning tool for providing health-care facilities to reduce the poisoning-associated mortality rate and provide baseline data for preventive strategies in the near future. In addition, there is a lack of data regarding clinico-epidemiological profile of acute poisoning cases in our region.

Hence, the present study was carried out with objectives to explore the pattern of acute poisoning cases and to study the sociodemographic determinant and clinical outcome of victims of acute poisoning in a rural tertiary care hospital of Maharashtra.

MATERIALS AND METHODS

This was a hospital-based, prospective study conducted at SRTR Government Medical College, Ambajogai, which is a tertiary care teaching hospital in rural part of Marathwada region of Maharashtra state. This study was carried out from June 2013 to May 2014. All the poisoning cases admitted during the study period to the emergency ward and intensive care unit medicine ward were included in the study. The cases of snake bite, food poisoning, and insect bites were excluded from the study. The patients who were not willing to participate or not willing to give informed consent were also excluded from the study.

The interview technique was used as a tool for data collection. A predesigned structured pro forma was used to record the necessary information. Informed consent was obtained from the patients or relatives before interviews. The diagnosis of poisoning was based on a history given by the patients or relatives and clinical examination. Detailed information was collected about the various

sociodemographic determinants, type of poison consumed, time span of hospitalization, mode of poisoning, duration of hospitalization, and the outcomes of the victims of poisoning. Clinical signs and symptoms of all victims of acute poisoning were recorded. Identification of poison was done on the basis of statement of patient/witness, smell of poisoning agents, specimen brought, and characteristic features of poisoning in majority of cases. Continuous follow-up of all patients was done for entire hospitalization and outcome was evaluated (categorized as death/survival).

A study approval from Institutional Ethical Committee was obtained before the initiation of study. Data analysis was done using Microsoft Excel 2007. Descriptive statistics was used to summarize baseline characteristics of the study participants. The analyzed data were presented in the form of text, tables, and graphs.

RESULTS

A total of 142 cases of acute poisoning were enrolled in this study based on inclusion and exclusion criteria. In the present study, 89 (62.68%) patients were male victims and 53 were females (37.32%). Most of the victims of acute poisoning were from rural area, i.e., 77.46% , and majority of them were farmers, i.e., 43.67%. The most common age group involved was between 20 to 40 years, i.e., 64.78%. Majority of them were married, i.e., 76.76% and were belonged to low socioeconomic class, i.e., Class IV and V, 112 (78.87%) (Table 1).

As shown in Table 2, poisoning cases more commonly occurred during December-February, i.e., 42.97% followed by 22.53% during September-November. Suicidal poisoning was common, i.e., 57.74% and organophosphorous compounds were the commonly preferred poison, i.e., 67.60%.

As shown in Table 3, in the present study, >84% of cases reached the hospital within 3 h of exposure, of which >60% reached within 1 h. Mortality rate was noticed in the present study as 11.26%.

Mean duration of hospital stay was 4.07 days. The common source of poison was reported mainly from household and farm shed. The commonly observed clinical features were nausea, vomiting, giddiness, excessive salivation and sweating, and altered sensorium.

DISCUSSION

The present study was carried out in the rural part of Marathwada region of Maharashtra which has seen rise in the number of poisoning cases. There was a lack of data

Table 1: Sociodemographic profile of acute poisoning cases (*N*=142)

Variables	Number of cases (%)
Age group	
<20	17 (11.97)
20-30	55 (38.73)
30-40	37 (26.06)
>40	33 (23.24)
Resident (rural/urban)	
Rural	110 (77.46)
Urban	32 (22.54)
Sex	
Male	89 (62.68)
Female	53 (37.32)
Socioeconomic class	
Class I	5 (3.52)
Class II	6 (4.23)
Class III	19 (13.38)
Class IV	60 (42.25)
Class V	52 (36.62)
Marital status	
Married	109 (76.76)
Unmarried	32 (22.54)
Divorced	1 (0.70)
Occupation	
Student	30 (21.13)
Farmer	62 (43.66)
Homemaker	27 (19.01)
Laborer	13 (9.15)
Self-business	8 (5.63)
Government servant	1 (0.70)
Unemployed	1 (0.70)

Table 2: Seasonal pattern and poison pattern among poisoning cases (*N*=142)

Variables	Number of cases (%)
Season	
March-May	27 (19.01)
June-August	22 (15.49)
September-November	32 (22.54)
December-February	61 (42.96)
Mode of poisoning	
Accidental	57 (40.14)
Suicidal	82 (57.75)
Homicidal	3 (2.11)
Type of poisoning	
OP	96 (67.61)
Rodenticide	13 (9.15)
Not known	33 (23.24)

OP: Organophosphate

Table 3: Survival pattern and outcome of the poisoning cases (*N*=142)

Variables	Number of cases
Time of initiating treatment (hours)	
<1	67
1-3	53
3-6	10
6-12	6
>12	1
Outcome	
Death	14
Survived	128
Hospitalization days	
<1	6
1-3	21
4-7	102
8-15	10
16-30	2
>31	1

regarding clinico-epidemiological profile of acute poisoning cases in our region. Hence, the present study was carried out with objectives to explore the pattern of acute poisoning cases and to study the sociodemographic determinant and clinical outcome of victims of acute poisoning in a rural tertiary care hospital of Maharashtra.

In the present study, most of the patients were male victims, and male:female ratio was 1.68. This was similar to a study conducted by Prayag *et al.*^[11] and Churi *et al.*^[12] Most of the victims of acute poisoning were from rural area. The most common age group involved was between 20 and 30 years of age. This may be due to the involvement of male adults in outdoor activity and more exposure to stress and strain associated with occupation. Most of the patients were belonging to low socioeconomic class. This might be attributed due to financial crises at household level. Similar findings were reported by Somasundaram *et al.*^[2] In rural Maharashtra, a study done by Kora *et al.*^[13] and a study conducted by Mishra *et al.*^[14] in central region of Nepal reported similar findings. Kaur *et al.*^[15] also reported that acute poisoning is more common in young males in rural areas.

In the present study, poisoning cases commonly occurred during December-February. Other studies show different trends, i.e., more number of cases in summer months reported by Maharani and Vijaykumari^[4] in Tamil Nadu.

Majority of the poisoning cases were suicidal (57.75%), which was similar to the findings of other studies.^[12,16] Most of the patients were farmers followed by students and homemakers.

This may be due to involvement with monsoon-dependent cultivation practices, crop failure, and other economic burdens. This was in accordance with various studies carried out elsewhere.^[11,14,17]

Organophosphorous compounds were the commonly preferred poison. The same evidence was reported from other studies done in South India and West Bengal, i.e., study by Kora *et al.*^[13] and Banerjee *et al.*^[18] Prayag *et al.*^[11] also reported similar findings. Easy availability of organophosphorous compounds at cheap rate, lack of control on selling these compounds, and major occupation in this region being agriculture may be responsible for preference of these compounds. However, a study conducted in New Delhi showed that drugs and insecticides were the most common agents. This difference within the country may be due to difference in pattern, use, and availability of poison. In addition, difference in urbanization and literacy can also be responsible. Ours is an agriculture-based society and owing to easy availability of organophosphorous compounds, these are the most commonly used substances in poisoning.

Most of the patients were admitted in <3 h of consumption. This rate was comparable to the study by Patil *et al.*^[19] Mortality rate was noticed in the present study as 11.26%. This mortality rate was less than other studies, i.e., between 15% and 30%,^[2,18] but higher than those reported by Kora *et al.*^[13] and Padmanabha *et al.*^[20] Time laps in hours to reach the hospital were less in maximum number of cases which might be a reason for low mortality rate.

The main limitation of our study is small sample size and short duration. Furthermore, most of the cases were diagnosed on the basis of patients' history and clinical examination. Studies with relatively larger sample size and duration of time with patients diagnosed with the help of laboratory investigations give better picture of situation. Nevertheless, this study managed to provide important information regarding clinico-epidemiological profile and pattern of acute poisoning cases.

CONCLUSION

The present study concludes that acute poisoning is an alarming public health problem. It affects the larger number of male population. Seasonal trend of poisoning was noticed more in the 2nd half of the year. The predominant mode of poisoning was suicidal, and OP compounds were the preferred poison. However, it calls for reforms in microeconomic, agricultural projects, appropriate social security, and satisfactory interpersonal relationship to check the high incidence of acute poisoning.

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