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Hospital Based Analysis of Clinical Profile and Outcomes of Poisoning

KEYWORDS: Poisoning, Organophosphates, pesticides, aspiration pneumonia, self harm.

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ABSTRACT *BACKGROUND: Acute poisoning is associated with significant morbidity and mortality. Aim of this study was to identify the clinical features and outcomes of poisoning cases reporting to a tertiary care hospital in India.*

METHODOLOGY: All cases of poisoning requiring admission were included. Demographic features, details of poisoning, and outcomes including deaths were recorded.

RESULTS: Of the 104 poisoning cases, 59 were males. All cases were due to deliberate self-harm. Organophosphates were the most common poisoning agents encountered (39.4%). The poison was undetermined in 8.7%. Median time to presentation was 154±64 minutes. Organophosphate poisonings were complicated by development of intermediate syndrome, prolonged ventilation and hospital stay. A total of ten deaths occurred, half of which were caused by secondary complications such as aspiration pneumonia.

CONCLUSION: Organophosphorus poisoning was the most common type of poisoning and contributed to significant morbidity and mortality.

Introduction

Acute poisoning is an important cause for morbidity and mortality worldwide.[1] Varieties of substances are involved in poisoning, determined largely by socio-economic factors, geographic location and availability. Majority of poisoning cases in India involve ingestion of insecticides and drug over dosage.[2, 3] Management can be challenging due to uncertainty in the identification of poisons in some cases, late presentation and development of secondary complications such as aspiration pneumonias and heart blocks in certain others. The present study was done with an aim to identify the clinical features, management and outcomes of acute poisoning in subjects requiring hospitalization.

Materials and methods

The present study was a cross-sectional observational study conducted in a tertiary care hospital in South India and was part of a randomized control trial that was approved by the institutional ethics committee. All cases of acute poisoning requiring admission for management were included in this study. Snake bites and scorpion stings and pediatric posioning were excluded from the study. Demographic features, details of poisoning, clinical features, management, need for ventilation and intensive care stay, and other outcomes including deaths were recorded meticulously in a data table.

Statistical analysis

Continuous data with normal distribution were expressed as mean ± standard deviation, while categorical variables were expressed as number (percentage). Continuous variables that were not normally distributed were expressed as median (interquartile range). Data analysis was performed using IBM SPSS software version 18 (IBM SPSS Inc., Illinois, Chicago, USA).

Results

A total of 104 acute poisoning cases were included in the analysis. Baseline characteristics of the patients are summarized in table 1. Among the poisoning cases, 59 were males. Mean age of the study population was 30 years (males 31, females 28 years). Majority of the patients were in 18-40 years age group. Seventeen were smokers and 21 had history of alcoholism. All cases of poisoning were due to deliberate self harm, and was their first instance of poisoning.

Table 1. Clinical profile of poisoning

Variable	Value
Age, years	30 ± 12
Males, no (%)	59 (56.7)
Diabetes, no (%)	4 (3.8)
Hypertension, no (%)	3 (2.9)
Smoking habit, , no (%)	17 (16.3)
Alcohol intake, , no (%)	22 (21.2)
Chronic obstructive airway disease, no (%)	2 (1.9)
Time to presentation after poison ingestion [in minutes]	154 ± 64
Systolic blood pressure, mmHg At admission	122 ± 19
Heart rate at admission, beats per minute	98 ± 18
Saturation, %	93 ± 12
Glasgow Coma Scale score	13 (13-15)
Intubation, no (%)	32 (30.8)

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Place of intubation, no (%)	
Emergency room, no (%)	23 (22.1)
Ward	8 (7.7)
Intensive care unit	1 (0.9)
Admission, no (%)	
Ward	82 (78.8)
Intensive care unit	22 (21.2)
APACHE II score	7 (4-9.75)
Early enteral feeding, no (%)	72 (69.2)
Stress ulcer prophylaxis, no (%)	94 (92.2)
Re-intubation, no (%)	6 (0.5)
Tracheostomy, no (%)	9 (0.9)
Dialysis, no (%)	3 (2.9)
Temporary pacemaker, no (%)	10 (9.6)
Hemoglobin, mg/dl	14.2 ± 2.3
Total WBC count, per cumm	12700 ± 4827
Serum creatinine, mg/dl	0.9 ± 0.5
Random blood sugar, mg/dl	127 ± 41
Serum sodium, mmol/L	140 ± 4
Serum potassium, mmol/L	3.6 ± 0.6
Serum bicarbonate, mmol/L	20 ± 3
Liver dysfunction, no (%)	3 (2.9)
Pseudocholinesterase in Organo-phospahte poisoning, U/l	539 (317-1237)

Organophosphorus compounds was the most common poisoning substance encountered in this study and accounted for 39.4% of the total cases of poisoning (figure 1). Pyrethroids were the next common agent involved followed by multiple drug overdosages, fertilisers and rodenticides. The nature of poison was undetermined in 8.7% of the cases. Drug over dosages involved tricyclic antidepressants, barbiturates, benzodiazepines and phenytoin. Organophosphate poisoning was severe in 18.3%. Route of poisoning was oral in all cases.

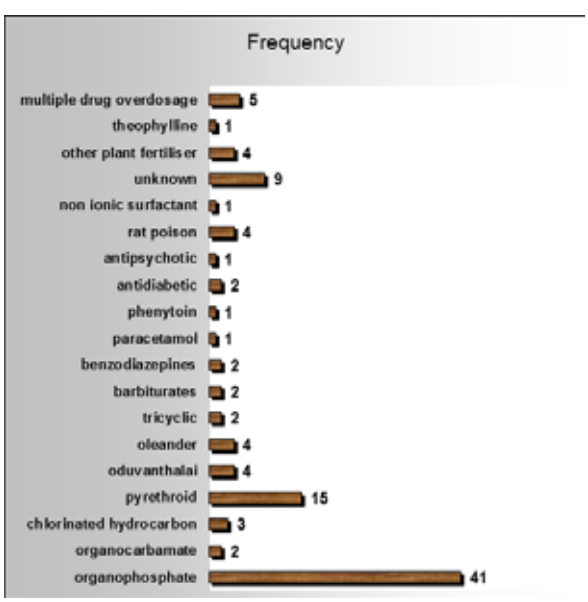

Figure 1. Frequency charting showing distribution of agents involved in poisoning

Median time to presentation after poison ingestion was 154 ± 64 minutes. All patients received gastric lavage with active charcoal as part of management. A total of 22 patients needed direct admission to intensive care unit. Thirty two patients (30.8%) required intubation and mechanical ventilation, of them 23 required intubation at admission in the Emergency unit. In the ward, additional 8 patients needed intubation and additional 1 patient was intubated in the intensive care unit. Median (interquartile range) Glasgow Coma Scale and APACHE II score at admission were 13 (13-15) and 7 (4-9.75), respectively. Temporary pacemakers were inserted in 10 patients, most of which were cases of Oleander and Cleistanthus collinus (locally known as Oduvanthalai) poisoning. Re-intubation and tracheostomy was needed in 6 and 9 patients, respectively. These were mostly in cases of Organophosphate associated intermediate syndrome. Median serum pseudo cholinesterase levels were 539 (317-1237 U/l.

Overall, 17.3 % (n= 18) of the study population developed aspiration pneumonitis. Out of 32 ventilated patients, 17 had developed pneumonia. Non fermenting gram negative bacteria, pseudomonas, and alpha hemolytic streptococci were isolated from cultures. Three patients needed hemodialysis. A total of ten patients enrolled in the study died, five patients died because of pneumonia and sepsis. Others died due to severity of poisoning.

Discussion and conclusions

The present study, a hospital based observational study examined clinical profile and outcomes of poisoning. Knowledge of patterns of poisoning and agents consumed in a particular region along with clinical features can help in early diagnosis especially when there is uncertainty regarding the poison. The present study revealed that Organophosphate and other pesticides were the most common agents of poisoning in this region and were associated with significant morbidity and mortality, a finding that has been observed in other epidemiological studies.[4-10] Most of the patients who consumed pesticides came from an agricultural background, while those in cities presented with drug over dosages. Exposure to Organophosphates results in inhibition of acetylcholinesterase, an enzyme that degrades the neurotransmitter acetylcholine. Accumulation of acetylcholine leads to overstimulation of muscarinic and nicotinic receptors which results in clinical manifestations.[11] Typical clinical findings of Organophosphate poisoning help in easy identification especially when there is uncertainty regarding the ingested poison. Certain poisonings present with seizures, for instance Pyrethroids while others such as Oleander poisoning and Oduvanthalai poisoning may present with rhythm disturbances and require temporary pacing.[12] Nature of the poison was undetermined in 8.7% in this study.

All cases of poisoning in this study were due to deliberate self harm. The study excluded pediatric poisoning (more likely to be accidental) and unintentional poisoning due to snake bites and scorpion stings. Majority of the cases involved young adults reflecting stresses in family life, occupation and that of modern lifestyle. Most of the cases involved males since many of them are laborers and have easy access to pesticides and fertilizers. This is in concordance with the study conducted by Batra et al.[13] Poverty, loss of income, seasonal fluctuations in crop productivity due to drought, 'love failure' etc are some of the driving factors for self harm among young adult males.

Median duration of hospital stay was 12 days, but was as high as 29 days in cases of Organophosphate poisoning imposing a great deal of burden on the families and care givers. This group of poisoning cases was also complicated by pneumonias and intermediate syndrome, requiring prolonged mechanical ventilation and intensive care stay. Vast majority of patients (87%) were discharged alive from the

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hospital. Majority of deaths occurred in patients who had ingested organophosphates.

In conclusion, Organophosphates were the most common agent involved in cases of poisoning in this study and were associated with significant morbidity. Other agents added to the burden of poisoning. Steps are needed to tackle this problem affecting younger productive members of the society.

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