

Study of acute poisoning cases in and around chitradurga, a retrospective study at district hospital

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Abstract

Introduction: Acute poisoning is a major public health issue in many countries around the world. 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. In developing countries such as India the reported mortality of 10% is significantly higher than the 0.5% reported in developed countries. **Materials and Method:** The present study was a retrospective study conducted over a period of twenty-four months at district hospital, Chitradurga. Case records of poisoning cases from January 2011 till December 2012 were reviewed retrospectively. **Results:** A total of 408 patients of various poisoning cases were studied. Incidence was more common among males (74.6%) compared to females (25.4) with a ratio of 3:1. Most cases of acute poisoning presented in the age group between 20 and 29 years (31.2%) followed by 12 to 19 year age group (30.2%). By occupation, 44.8% of the cases were farmers and laborers (183) followed by housewives (13.2%, 54), students (12.5%, 51), unemployed (10.2%, 42) and businessmen (8.8%, 36). A majority of the poisoning cases (36.0%) were due to organophosphorus compound (OPC) followed by snake bite (16.2%), drugs (11.0%), rat poison (7.3%) and others. **Conclusions:** Incidences of intentional poisoning are rising day by day due to social, emotional and professional stress. Most commonly used agents for intentional poisoning are pesticides or medicines by the people. The findings of the study conclude that intentional poisoning was more in male adults and in female adolescent group. The mortality and morbidity due to poisoning can be reduced by conducting educational programs in rural areas and providing counselling services and poison information services to the needy people.

Keywords: poisoning, mortality

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INTRODUCTION

Acute poisoning is a major public health issue in many countries around the world. 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. The

poisoning with Pesticide accounts for about one-third of the world's suicides.¹ The proportion of all suicides using pesticides varies from 4% in the European region to over 50% in the Western Pacific region, but this proportion is not concordant with the volume of pesticides sold in each region; it is the pattern of pesticide use and the toxicity of the products, not the quantity used, that influences the likelihood that they will be used in acts of fatal self-harm.² In developing countries such as India the reported mortality of 10% is significantly higher than the 0.5% reported in developed countries.² In India, acute poisoning is among the leading five causes of hospital death.³ The highest incidence is reported from rural areas. The high mortality reflects the wide availability of highly toxic compounds such as pesticides⁴ and limited resources to treat poisoned patients in rural primary hospitals.⁵ The type of poisoning is influenced by availability as well as other factors such as prior knowledge about the poison

and its effects gained through different means of communication and information including media.⁶ More recent data highlighting longitudinal trends may have implications for health-care planning. Studies have revealed that pesticides are the commonly used poisoning agents for intentional poisoning in India. As agriculture is major profession in the rural part of India farmers stock the pesticides to eradicate the weeds and pests. Due to easy availability of the pesticides, they are commonly used by the individuals to end their life in stressful situations.⁷ This study was conducted at Chitradurga district which has a population of 1,660,378, roughly equal to the nation of Guinea-Bissau or the US state of Idaho. This gives it a ranking of 297th in India (out of a total of 640). The district has a population density of 197 inhabitants per square kilometer (510/sq mi). Its population growth rate over the decade 2001–2011 was 9.39%. Chitradurga has a sex ratio of 969 females for every 1000 males, and a literacy rate of 73.82%. Chitradurga district is a low rainfall region and is affected by draught very frequently.

MATERIALS AND METHOD

The present study was a retrospective study conducted over a period of twenty-four months at district hospital, Chitradurga. Case records of poisoning cases from January 2011 till December 2012 were reviewed retrospectively. A specially designed data collection form was used to collect the details of patients’ demography, type of poisoning agents consumed, route of administration (oral, inhalation, dermal or eye exposure), name of the poison consumed, quantity consumed, route of exposure, first aid rendered, signs and symptoms, investigations done, treatment given, specific antidote

given, complications developed, treatment outcomes and events of mortality and the reasons for the mortality. The study was approved by the institutional ethics committee.

RESULTS

A total of 408 patients of various poisoning cases were studied. Incidence was more common among males (74.6%) compared to females (25.4) with a ratio of 3:1. Most cases of acute poisoning presented in the age group between 20 and 29 years (31.2%) followed by 12 to 19 year age group (30.2%). By occupation, 44.8% of the cases were farmers and labourers (183) followed by housewives (13.2%, 54), students (12.5%, 51), unemployed (10.2%, 42) and businessmen (8.8%, 36). A majority of the poisoning cases (36.0%) were due to organophosphorus compound (OPC) followed by snake bite (16.2%), drugs (11.0%), rat poison (7.3%) and others. Drugs used were phenobarbitone, diazepam, alprazolam, cough syrups and mixture of tablets/capsules. Corrosives were acids and kerosene. Total mortality was found to be 15.4% (63). Mortality rate was 62.5% among patients with corrosive poisoning followed by a mortality of 26.5% in OPC. Patients who died due to OPC (39 cases) had respiratory arrest (27 cases), pneumonia and septicaemia (9 cases) and sudden cardiac arrest (3 case). Two patients had aspiration pneumonia and one had nosocomial pneumonia. Mortality in snake bite poisoning (6 cases) was because of respiratory paralysis (3 cases) and severe hemorrhage (3 cases). There was no mortality in organocarbamate and organochlorine compounds. Mortality rate due to corrosives was significantly high compared with OPC poisoning ($\chi^2 = 4.12$, $P = 0.04$) [Table 1].

Table 1: Types of poisoning and mortality

Type of poisoning	Number of patients (%)	Mortality (%)
Organophosphorous	147 (36%)	39 (61.9%)
Snake bite	66 (16.2%)	06 (9.5%)
Drugs	45 (11%)	00
Rat poison	30 (7.4%)	00
Corrosives	24 (5.9%)	15(23.8%)
Organocarbamates	21 (5.1%)	00
Organochlorine	15 (3.7%)	00
Miscellaneous(Plant and unknown)	60 (14.7%)	03 (4.8%)
Total	408	63

Maximum patients²¹ expired when there was a delay in admission to hospital by more than 8 hours after ingestion, followed by a time period of 5-8 hours¹⁸. Patients admitted within 2 hours of ingestion had the least mortality⁶. Time lapse had a significant role in the mortality in cases of acute poisoning ($\chi^2 = 10.9$, $P = 0.01$)

[Table 2]. The mortality pattern among males and females are comparable in each type of poisoning [Table 3]. First aid was not found to be significant in minimizing the mortality of patients ($P = 0.768$). A total of 39 (13.3%) and 24 (21%) patients expired out of total 294 patients who received first aid and 114 patients who did not

receive first aid, respectively. When we subdivided the cohort according to the type of poison, again the role of

first aid did not have any significant bearing on the outcome.

Table 2: Time elapsed since exposure to hospital arrival and mortality

Time lapsed (hours)	Total cases	Mortality (%)
<2	90	6 (6.7%)
2-4	114	15 (13.2%)
4-8	84	18 (21.4%)
>8	66	21 (31.8%)
Unknown	54	03 (5.6%)
Total	408	63

Table 3: Mortality of each type of poisoning among males and females (N = 50)

Type of poisoning	Mortality	
	Male	Female
Organophosphorous	29	10
Snake bite	04	02
Drugs	00	00
Rat poison	00	00
Corrosives	12	03
Organocarbamates	00	00
Organochlorines	00	00
Miscellaneous	02	01

It was found that 77.9% (318) of cases were of intentional poisoning for suicidal attempt and 22.1% (90) of cases had accidental poisoning. A majority (73%) of accidental poisoning were due to snake bite. Of a total of 63 patients (15.4%) who expired, 6 (9.5%) were secondary to accidental poisoning and the remaining 19 (90.5%) were secondary to intentional poisoning. Median hospital stay was 4 days. Only 13 patients (9.6%) stayed in the hospital for more than 15 days.

DISCUSSION

In the present study, pesticides followed by snake bite were the two most common types of poisoning. A study conducted in Pondicherry revealed a rapidly increasing trend in the incidence of OPC poisoning over a 3-year period.⁶ Other studies also showed that OPC are the most commonly used poisoning substances.³ In contrast, a study conducted at the All India Institute for Medical Sciences, New Delhi, showed that drugs (18%) and insecticides (12.80%) are the most common agents out of a total of 726 poisoning cases. Out of this insecticide group, carbamate⁴⁷ formed the largest group followed by OPC⁴³ and organochlorine compounds.⁸ This difference in the type of poisoning seen within the country may be due to the difference in the pattern of use and availability of pesticides. In this study, majority of the poisoning cases presented between 12- and 29-year age group (84, 61.7%). Similar findings were observed in other studies.^{3, 8}

Males dominated the present study with male to female ratio of 3:1. However, some other studies have shown that males are marginally higher compared to females and

marginally more among females in others.^{4,9} This high proportion of poisoning among males might be due to change in the lifestyle and cultural patterns in this area and other studies. In our study, the overall mortality was found to be 15.4%. Similar data were also obtained by a study which reported an overall mortality rate of 17.3%.¹⁰ Other studies showed it as 3% - 4%.¹¹ Mortality in the present study is probably higher because of a higher number of pesticide and corrosives poisoning cases and higher rate of complicated cases. Majority of the suicidal cases were associated with reactive depression. High degree of stress in academic, financial and social sectors as well as inability to achieve the targets on professional, educational and socioeconomic fronts leading to limited alternatives were the contributory factors in taking suicidal actions. Similar factors were observed by others.^{6, 12} Majority of the patients (78%) consumed the poison with suicidal intent as compared with 22% of the patients exposed accidentally. A study conducted in Kathmandu (16-65 years age group) reported that 97% of the poisoning cases admitted in a hospital were due to suicidal attempt.⁹ However; this study did not include snake bite cases unlike in our study. In contrast, another study done at New Delhi highlighted that nearly half (47%) of poisoning cases were accidental (1-70 age group).¹³ But this study had included pediatric cases also unlike in our study in which we included only adolescents and adults. As it was a retrospective study, it was difficult to draw firm conclusions regarding the role of first aid in acute poisoning. We feel that a prospective multicentric study with uniform criteria regarding first aid will give a

final answer regarding the role of first aid. 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. 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.

CONCLUSIONS

Acute poisoning remains a major public health problem in developing country like India and pesticide poisoning remains the most important poison. However, cases of medicinal drug poisoning have recently dramatically increased. Youth in these rural communities remain very vulnerable to acute poison. This represents a very high risk group who should be targeted in primary prevention programs. A school based intervention to address the issues leading to self poisoning might even be effective in this setting. The reasons observed for the mortality in poisoned individuals were the delay in admission to hospital, improper management of the poisoned patient, lack of information regarding the poison agent and its antidote. To reduce the poison induced morbidity and mortality following steps such as having a centralised poison information centre, availability of standard treatment protocols for managing various poisons, and educational programs for rural people may be more appropriate. Incidences of intentional poisoning are rising day by day due to social, emotional and professional stress. Most commonly used agents for intentional poisoning are pesticides or medicines by the people. The findings of the study conclude that intentional poisoning was more in male adults and in female adolescent group. The mortality and morbidity due to poisoning can be reduced by conducting educational programs in rural

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