

# Clinical Profile of Acute Poisoning in a Tertiary Care Hospital in Sub Himalayan Region

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**Abstract:-** Acute poisoning is a major public health problem leading to significant morbidity and mortality in all ages throughout the world. 379 patients with acute poisoning above the age of 18 years were studied retrospectively. Majority of the patients belonged to 18-40 years of age with a male preponderance. Incidence of intentional and unintentional poisoning was 48% and 52% respectively in our study. Common causes of poisoning were poisonous bite(50.1%) followed by organophosphus poisoning (14.8%), aluminium phosphide poisoning(12.7%) and rodenticide poisoning (5.5%). Most common route of exposure was dermal (54%). Most common symptoms were vomiting, abdominal pain, local inflammatory reactions in case of bite, altered sensorium and shortness of breath. Mortality rate in our study was 16.4%.

**Keywords:-** Incidence, aluminium phosphide, snake bite, public health, morbidity.

## I. INTRODUCTION

Poisoning is defined as the occurrence of dose related harmful effects resulting from exposure to chemical, drugs or xenobiotic [1]. Acute poisoning whether intentional or unintentional is a major public health problem leading to significant morbidity and mortality in all ages throughout the world[2]. According to WHO, more than 8,00,000 people die by suicide every year of which 75% occurred in low and middle income countries. This high fatality rate in these countries may be due to the easy accessibility to poisonous substances and sparse medical facilities. In young people between the age of 15-29 years, suicide is the second leading cause of death worldwide. Suicidal death rate among men is three times higher than women in developed countries whereas in low- and middle-income countries the male-to-female ratio is 1.5:1[3]. Suicide leads to a considerable amount of impact on family as well as on society.

According to National Crime Bureau of India estimate, intentional poisoning accounted for 26% deaths in year 2014[4]. The various factors responsible for increased incidence of poisoning include rapid industrialization, easy availability of a vast number of insecticides, increasing use of chemicals for domestic purpose, unsafe practices, lack of protective clothing, poverty, illiteracy, ignorance and quack remedies containing poisonous drug [5]. The profile of poisoning is different in different parts of country and depends upon the availability and accessibility of poison in that area, socioeconomic status of the individual and cultural and religious influences etc[6]. Organophosphorous poisoning is more common in south India while aluminium phosphide poisoning in north India[7].

Apart from the ingested poison, poisoning due to the animal bite especially snake bite, hymenoptera sting and scorpion stings are also common in India. According to an estimates, more than 5 million venomous snakebites occur every year of which 125,000 die[8]. Most of these deaths occur in rural areas due to the inadequate primary treatment and lack of tertiary care facilities. Snake bites are also a common cause of morbidity and mortality in Himachal Pradesh although most of these bites are caused by non-poisonous snakes. Low environmental temperature and heavy rains are the factors which favour the flourishing of a huge herpetofauna in the state [9].

Medically important Hymenopterans are Apidea (honey bee and bumble bee), Vespidia (wasp, hornets and yellow jackets) and Formicidae (ants). Response to Hymenoptera sting include normal local reaction, large local reaction, systemic anaphylactic reaction, systemic toxic reactions and unusual reactions. Toxicity to organ is main cause of death in hymenoptera stings rather than anaphylactic shock [10].

The study was conducted with aim to generate the clinico-epidemiological data of acute poisoning cases presented at our hospital. This in turn will be helpful in planning rational use of available resources for prevention and management of poisoning cases.

## II. METHOD AND MATERIAL

This retrospective hospital record-based study was conducted in a tertiary care hospital which included the patients above the age of 18 years admitted in medical ward with various acute poisonings from July 2015 to June 2016. Cases with hymenoptera sting and snake bite were also included in the study. Data was analysed with respect to age, sex, poison consumed, clinical manifestations, duration of hospitalization, treatment given, type of poisoning and outcome.

## III. RESULT

In our study, we reviewed 379 cases of acute poisoning admitted at our hospital from July 2015 to June 2016 retrospectively. In this study, age of the patients ranged from 18-93 years and the mean age of the patients was  $38.9 \pm 16.2$  years. Majority of affected cases (61.5%) belonged to 18-40 years of age. Among them, 122(32.19%) cases were found in 21-30 years of age group and 83 (21.90%) in 31-40 years age group [Table1]. Incidence of acute poisoning was more common among males (51.98%) as compared to females (48.02%) with male to female ratio 1.08:1. Acute poisoning was intentional in 182 cases (48%) and accidental in 197(52%). 93.1% of the patients

consumed poison with suicidal intent. Most common poison used for intentional poisoning was organophosphorus (14.8%) followed by aluminium phosphide (12.7%) and rodenticide poisoning (5.5%) whereas accidental poisoning cases were due to Snake bite and hymenopteran stings (50.1%). 55 out of 159 cases of snake bite did not show any sign of local or systemic envenomation. Majority of poisoning cases (33%) were due to pesticides followed by snake bite (27.44%), wasp and bee bite (8.4%), herbicides (4%) and drug overdose (2.4%). Benzodiazepine and paracetamol were commonly used drugs. Among various routes of exposure, most common route of exposure was dermal (due to bite or sting by venomous animal or insect) (50.4%) followed by ingestion (46.44%) and inhalation (1.32%). More of the poisoning cases were reported in rainy season (40.1%) followed by summer (27%). Most common symptoms experienced by the patients include vomiting (52.8%), abdominal pain (15%), local swelling (15%) and pain (10.6%) in case of snakebite and hymenopteran sting, altered sensorium (9.2%) and shortness of breath (5.5%). 4 patients required mechanical ventilation.

Age groups (years)	Male	Female	Total (%)
<20	17	13	30(7.92%)
21-30	53	69	122(32.19%)
31-40	46	37	83(21.90%)
41-50	32	26	58(15.30%)
51-60	26	18	44(11.6%)
61-70	13	17	30(7.92%)
>70	10	2	12(3.17%)

Table 1. Distribution of patients by age and sex.

The hospitalization time in our study varied from 1-16 days with a mean duration of hospitalization of 3 days. 82% patients were discharged from hospital after treatment whereas 3 patients were discharged on request and one patient left the hospital against medical advices. Mortality due to all causes of poisoning was 62(16.4%) [Table 2]. Highest mortality was seen in aluminium phosphide poisoning (54.7%) followed by organophosphorus poisoning (26.8%).

Causative agent	No. of patients	Mortality (%)
Snake bite	159	4(2.5)
Organophosphorus	56	15(26.8)
Aluminium phosphide	48	26(54.7)
Wasp bite	33	4(12.1)
Rodenticide	21	2(9.5)
Miscellaneous	62	11(17.7)
Total	379	62(16.4)

Table 2. Distribution of patients by the type of poison and mortality.

#### IV. DISCUSSION

Of total 379 cases included in our study, males patients were 51.98% and female patients were 48.02% which is similar to findings of Karki et al (54.7% male, 45.3%

female) [11]. A similar male preponderance was found in other studies [2,7,12]. In contrast to this, Pokhrel et al had reported a high incidence among females [13]. An equal incidence of acute poisoning was observed by Meeran et al in both males and female [14]. This higher incidence of poisoning in men as compared to women may be due to the difference in methods to deal with stress of daily life, easy accessibility to poisonous substance, pattern of alcohol consumption and difference in care seeking rates for mental disorder [3].

In present study, majority of the cases were in the age group of 18-40 years (61.5%). The highest incidence (32.19%) of acute poisoning was observed in 21-30 years of age group followed by 31-40 years of age group (21.90%). In a study done by Shah et al, maximum cases were reported in age group of 21-30 years (38.82%) followed by 31-40 years (20.29%).<sup>2</sup> Similar trend of age group distribution was found in different studies done in different regions of the India [2,7,15]. In 15-29 years of age group, suicide is the second leading cause of death globally [3]. This increased vulnerability to suicidal behaviour in this age group may be due to the occupational hazards, financial problems, marital discord and adjustment disorders [2,7].

In the present study, most common route of exposure was dermal (50.4%) followed by ingestion (45.44%). This was in contrast to other studies where ingestion was the most common route of exposure [2,12]. This difference was due to the fact that in our study most of the poisoning cases were due to the bite or sting by venomous animal or insects. Intentional poisoning was observed in 182 cases (48%) followed by accidental poisoning in 52% of cases. Consumption of poison with suicidal intent was found in 93.1% cases in our study. Intentional poisoning was reported among 148 cases (98.66%) by Maharani et al and 84 (80.8%) by M. Shoiab et al [7,12]. Snake bite was not included in these studies unlike our study. Most of the accidental poisoning cases in present study were due to snake bite (42%). Shah et al and Sande et al had found 34.16% and 37.94% cases of accidental poisoning in their studies respectively [2,5]. In contrast to our study, Srivastava et al reported 47% of accidental poisoning cases in paediatric age group which we have excluded from our study [16]. Incident of accidental poisoning was 1.44% in study done by B. Maharani which did not include the snake bite cases [12].

In present study, the most common type of poisoning was due to snakebite (42%) followed by pesticide (33%), wasp and bee bite (8.4%), herbicide (4%) and drug overdose (2.4%). Majority of the people in our state live in the rural set up and are agriculturist by occupation. This could be reason for higher incidence of snake bite in our study. Incidence of snake bite was 25.88% and 27.44% in the studies done by Shah et al and S. Sande et al respectively [2,5]. Organophosphorus (14.8%), aluminium phosphide (12.4%) and rodenticides (5.5%) were commonly used pesticides for intentional poisoning in our study. Incidence of organophosphorus poisoning was 19.41% in study done by Shah et al and 30.8% in study done by S. Sande et al [2,5]. Zaheer et al had found aluminium

phosphide (30.8%), zinc phosphide (23.1%) and organophosphorus (15.4%) as most commonly used compound for suicide. This difference in the type of poison used in different regions of the country could be due to the difference in pesticide available in the particular area [7].

Seasonal variations lead to alteration in statistics of acute poisoning. In presents study, number of cases reported in rainy seasons were 40.1% followed by 27.44% in summer. B.Maharani et al had found 36% cases of poisoning in summer season [12].

On psychiatric assessment, in our study it was found that majority of suicidal cases were associated with depressive disorder. Other contributory factors include deliberate self harm, relationship issues in the family, chronic alcoholism and acute stress reaction. Similar findings were reported by Ramesha et al [17].

Duration of hospital stay in our study ranged from 1-16 days with an average of 3 days per patient. The median hospital stay was 5.39 days and 4 days per patient in study done by Shah et al and S. Sande et al respectively[2,5].

Mortality rate in our study was 16.4% compared to Shah et al 16.47%, 15.8% Joshi et al and 14.4% Zaheer et al[2,7,14]. The high mortality rate in our study may be due to the lack of information of poison consumed and most of the patients were referred from peripheral health institution resulting in the greater time lapsed between ingestion of poison and appropriate management of the patient.

## V. CONCLUSION

Acute poisoning is a major public health problem affecting the productive age group of 20-30 years. This leads to huge socioeconomic burden on the family and society. Mortality was higher in insecticidal poisoning. Easy availability of these compounds should be restricted by strict implementation of the pesticide acts. Educational programs with effective preventive strategies are required to increase the awareness among the general public about the seriousness of this problem. Psychiatric counselling of the persons with psychosocial problem should be done to reduce the morbidity and mortality.

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