

Incidence, Clinical Assessment and Outcome of Acute Poisoning In Indian Patients

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Abstract: Objective: To study the incidence of acute poisoning in various age group, gender, occupation; common nature and type of poisons; major route of exposure; clinical assessment and outcome in Indian patients. Methods: The study involved 100 patients (18-60 years of age) of either gender with acute poisoning admitted in emergency ward. Patients were examined upon admission in order to assess their clinical status. Results: Incidence of acute poisoning was highest in younger age group between 21–30 years (49%) with phenyl being the most common poisoning substances used. Incidence of poisoning was higher in female patients (59%). Incidence of suicidal poisoning was higher in urban area (90%) and married people (68%); out of which females had higher rate (59%) than male (41%). Incidence of poisoning was higher in laborers (32%) and housewives (32%) followed by students (29%). Most common nature of poisoning was suicidal (77%) and the commonly used poisoning in suicidal attempt was phenyl (18.18%). Alcohol abuse was observed in 17% patients of acute poisoning and 39% patients had psychiatric illness. Most common route of poisoning was oral and common symptoms on admission were nausea, vomiting and abdominal pain. Mortality rate in acute poisoning was 2%. Conclusion: The incidence of poisoning is dependent on various factors such as age, sex, residential area and occupation. Outcome of poisoning also depends on type of poisoning, dose of poisoning & availability of health care services. Psychological assessment, social and economic security may be helpful to prevent incidence of suicidal poisoning. [H Chauhan, Natl J Integr Res Med, 2018; 9(3):3-8]

Key Words: Acute poisoning, Incidence, Suicidal, Accidental, Mortality

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Introduction: A poison is any substance that is harmful to our body by means of inhalation, ingestion, injection or absorption through skin. Poisonous materials are capable of causing adverse effects in living beings.¹ The pattern of poisoning varies from one region to another and mainly depends on factors like geography, ease of access and availability of poison, socio-economic environment; cultural and religious influences.² Occupational, accidental and intentional exposure is a major developing world health problem. Unsafe storage and harmful occupational practices exposes millions of people at risk. Anxiety, depression, isolation, unemployment, failure in examination, marital disharmonies are also some of the common precipitating factors for self-poisoning.³

According to World Health Organization (WHO), globally, there are more than three million of acute poisoning cases with 2,20,000 deaths occurring annually. Developing countries tend to have elevated poisoning rate and possible mortality due to inadequate drug and chemical regulation, improper surveillance and easy access to many various drugs or chemical.⁴

Benzodiazepine, paracetamol and ethanol are the most common causes of poisoning in high income countries such as Norway.⁵ On the other hand, poisoning due to pesticides and agrochemical

products is more common in countries like India as agriculture is one of the major occupations. Numerous studies have shown that organophosphates are the most common poisoning agents in rural India⁶. However, this trend now seems to change in northern and southern parts of India where studies have shown increasing incidence of poisoning with aluminum phosphide.⁷ Drugs were shown to be the next common agent abused in poisonings after pesticides. Rural populations of low socioeconomic groups are commonest sufferer. Thus, it is important to understand the patterns and outcome of acute poisoning.⁸

This study shows the incidence of acute poisoning in various age group, gender, occupation; common nature and type of poisons; major route of exposure; clinical assessment and outcome in Indian patients.

Methods: The present study was undertaken in medical department of a tertiary care hospital. The target population was patients of either gender between age of 18-60 years with acute poisoning admitted in emergency ward of medical department. The study duration was from October 2013 to September 2015. Patients with snake bite, insect bite, food poisoning and allergic reaction to drugs were excluded from study.

The study included 100 cases of adults, with acute poisoning due to drugs and chemicals. Patients were examined upon admission in order to assess their clinical status. After a thorough clinical and neurological examination, the patients' hepatic, respiratory and renal functions were closely monitored in order to identify the presence of hepatic, respiratory, renal or multi-organ failure. Specific antidotes, respiratory support or hemodialysis were available when necessary.

Data regarding age, gender, marital status, occupation, religion, locality, nature and class of

poison, time and month of intake, route of exposure, clinical manifestations of patients, outcome of poisoning, duration of hospital stay, treatments delivered to patients, associated co-morbid conditions, time interval were collected from the hospital and documented in the pre-structured proforma.

Results: In this study we included 100 patients between 18-60years of age. Details of patients distribution and characteristics are displayed in table and figures below.

Table 1: Age Distribution of Acute Poisoning

| Poisoning Substance | 18 -20 years | 21-30 years | 31-40 years | 41-50 years | 51-60 years | Total (%) |
|---------------------------|--------------|-------------|-------------|-------------|-------------|-----------|
| Acid | 1 | | | 1 | | 2(2%) |
| Agarbatti Scent Poisoning | | 1 | | | | 1(1%) |
| Bhang | | 2 | | | | 2(2%) |
| Bleaching powder (BP) | 1 | 3 | 4 | | | 8(8%) |
| Brown Sugar | | | 1 | | | 1(1%) |
| Chlorine | | | 1 | | | 1(1%) |
| Dettol | 1 | | 1 | | | 2(2%) |
| Godrej Dye | 1 | | | | | 1(1%) |
| Harpic | | 1 | | | | 1(1%) |
| Hit | | 1 | 2 | | | 3(3%) |
| Insecticide | | 1 | 1 | | | 2(2%) |
| Kerosene | | 2 | 3 | | | 5(5%) |
| Organo phosphorus(OP) | 1 | 4 | 3 | 1 | 1 | 10(10%) |
| Phenyl | 1 | 11 | 4 | 3 | | 19(19%) |
| Rantac | | | | 1 | | 1(1%) |
| Rat killing(RK) | 1 | 6 | 4 | | | 11(11%) |
| Sleeping pill(SP) | | 9 | 2 | 3 | | 14(14%) |
| All Out | 2 | 1 | 1 | | | 4(4%) |
| Unknown | 0 | 7 | 3 | 2 | | 12(12%) |
| TOTAL (%) | 9(9%) | 49(49%) | 30(30%) | 11(11%) | 1(1%) | 100% |

Figure 1: Gender Distribution

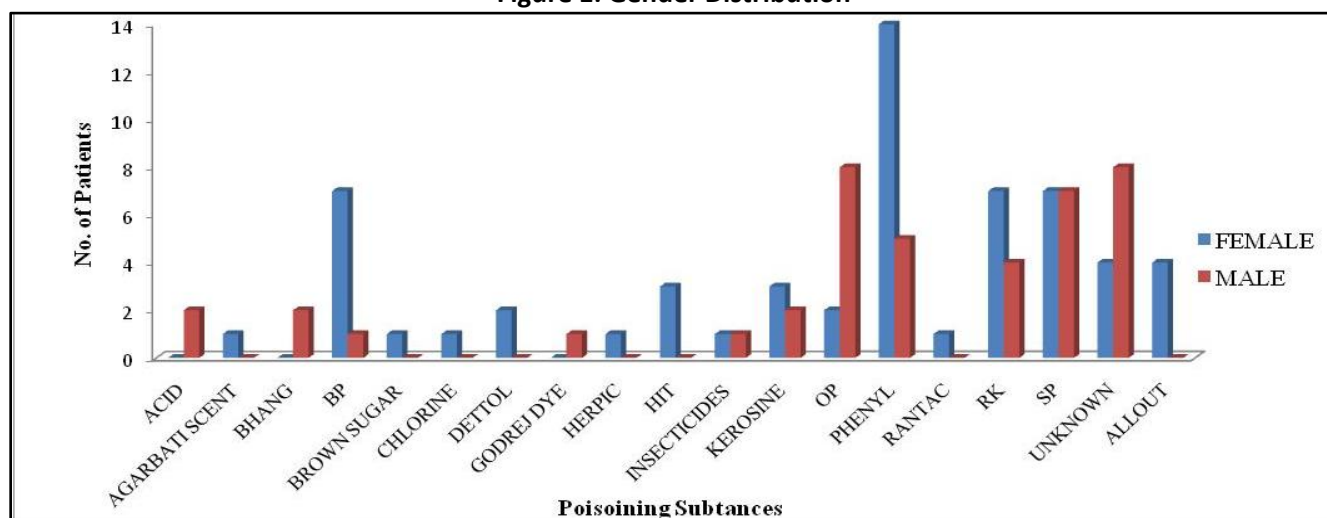


Figure 2: Residential Area Distributions

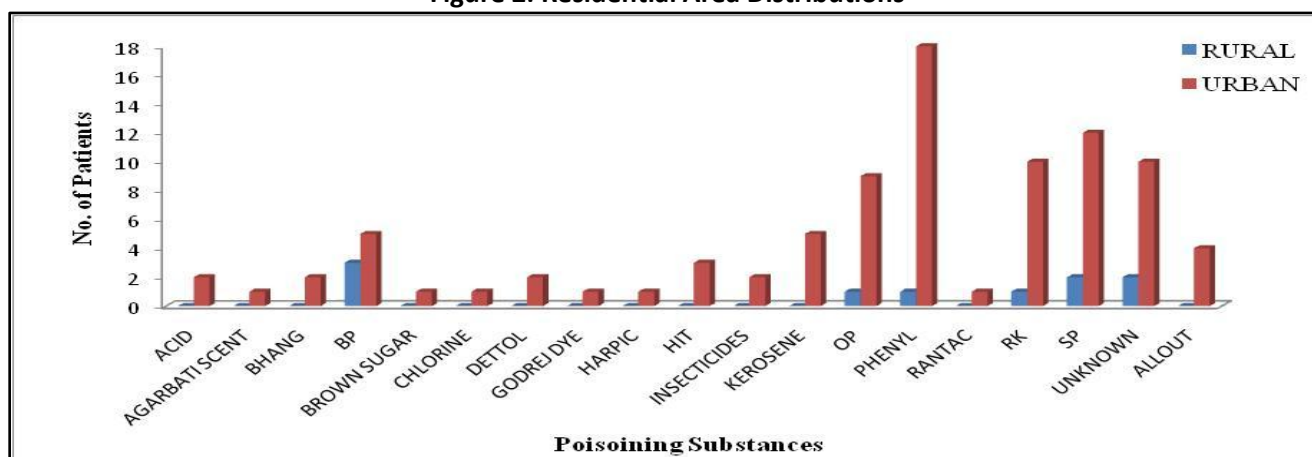


Figure 3: Marital Status of Patients

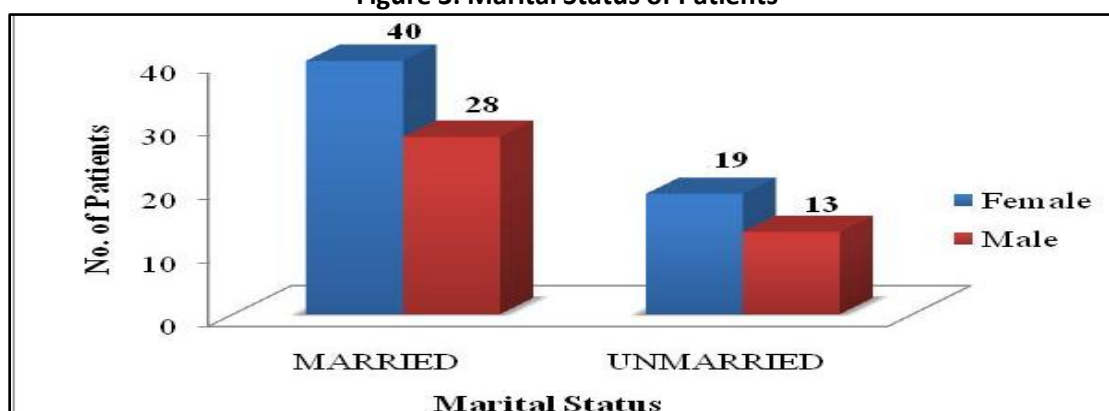


Table 2: Distribution of poisoning in various occupations

| Poisoning Substance | Farmer | Housewife | Job | Student | Laborer | Total (%) |
|---------------------------|--------|-----------|-------|---------|---------|-----------|
| Acid | | | | 2 | | 2(2%) |
| Agarbatti Scent Poisoning | | | | | 1 | 1(1%) |
| Bhang | | | 1 | 1 | | 2(2%) |
| Bleaching powder | | 6 | | 2 | | 8(8%) |
| Brown Sugar | | | | | 1 | 1(1%) |
| Chlorine | | | | | 1 | 1(1%) |
| Dettol | | | | 2 | | 2(2%) |
| Godrej Dye | | | | 1 | | 1(1%) |
| Harpic | | | | 1 | | 1(1%) |
| Hit | | 2 | | | 1 | 3(3%) |
| Insecticide | | | | 2 | | 2(2%) |
| Kerosene | | 1 | | | 4 | 5(5%) |
| Organophosphorus | | 1 | 3 | 2 | 4 | 10(10%) |
| Phenyl | | 8 | 1 | 5 | 5 | 19(19%) |
| Rantac | | 1 | | | | 1(1%) |
| Rat killing poison | | 3 | | 6 | 2 | 11(11%) |
| Sleeping pills | 1 | 6 | | 2 | 5 | 14(14%) |
| All Out | | 2 | | 1 | 1 | 4(4%) |
| Unknown | 1 | 2 | | 2 | 7 | 12(12%) |
| Total (%) | 2(2%) | 32(32%) | 5(5%) | 29(29%) | 32(32%) | 100(100%) |

Table 3: Nature of Acute Poisoning

| Poisoning Substance | Accidental | Suicidal |
|---------------------------|------------|----------|
| Acid | | 2(2%) |
| Agarbatti Scent Poisoning | | 1(1%) |
| Bhang | 2(2%) | |
| Bleaching powder | 2(2%) | 6(6%) |
| Brown Sugar | 1(1%) | |
| Chlorine | 1(1%) | |
| Dettol | | 2(2%) |
| Godrej Dye | 1(1%) | |
| Harpic | | 1(1%) |
| Hit | 1(1%) | 2(2%) |
| Insecticide | | 2(2%) |
| Kerosene | | 5(5%) |
| Organo phosphorus | | 10(10%) |
| Phenyl | 5(5%) | 14(14%) |
| Rantac | | 1(1%) |
| Rat killing poison | 1(1%) | 10(10%) |

| | | |
|----------------|---------|---------|
| Sleeping pills | 3(3%) | 11(11%) |
| All Out | | 4(4%) |
| Unknown | 6(6%) | 6(6%) |
| Total | 23(23%) | 77(77%) |

Figure 4: Source of Acute Poisoning

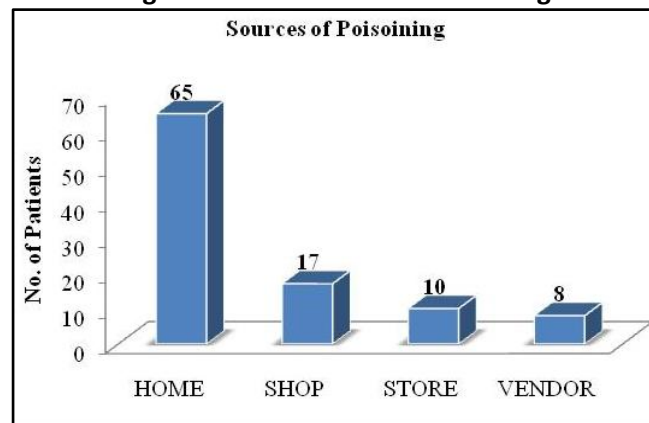


Table 4: Psychiatric Assessment

| Gender | Anxiety Disorder | Major Depressive Disorder | Schizophrenia | Bipolar Disorder | Total(%) |
|-----------|------------------|---------------------------|---------------|------------------|------------|
| Female | 8 | 13 | 0 | 3 | 24(61.53%) |
| Male | 4 | 8 | 1 | 2 | 15(38.47%) |
| Total (%) | 12(30.76%) | 21(53.84%) | 1(2.56%) | 5(12.82%) | 39(100%) |

Discussion: The study included 100 cases of adults with acute poisoning due to variety of toxic agents. Higher incidence (49%) in younger age group is comparable to study done by Das et al.⁹ This can be explained by the fact that the persons of this age group face stresses of the modern lifestyles, failure in love, family problems, nuclear family, career development etc. Phenyl (22.44%) was the most common poisoning substances used in this age group, this is because of easy availability at home or nearby chemists.

Higher incidence of poisoning in females (59%) with Phenyl poisoning commonest (23.72%) in them is comparable to Patil et al.⁸ and Ruan et al.¹⁰ Organophosphorus poisoning (19.51%) is commonest in males in this study is also comparable to Joshi et al.⁶ An early marriage along with its added familial responsibilities, social customs, limited resources etc. may be the factors responsible for females outnumbering males which is evident from the current study and studies from the past.¹¹ In males, common factors responsible for suicidal attempts were poverty and inadequate income. In the study done by Dash et al.¹¹ incidence of poisoning in

males was higher than females because study was done in rural community.

Highest frequency of poisoning occurred with household substances followed by pesticides. However, pesticides particularly organophosphates and aluminum phosphide were the most common causes of poisoning in several studies done in India.¹² The possible explanation to this discrepancy is the fact that most of the patients in the present study were from urban areas, and hence were less exposed to agrochemical fertilizers/compounds. Secondly, easy availability of household products like phenyl, bleaches, and their derivatives was responsible for higher incidence of poisoning due to household products.

Maharani et al.¹³ shows 67.33% patients were married having suicidal poisoning which was comparable to present study (68%). Out of which females had higher rate (59%) than male (41%). Poisoning was commonly found among housewives, laborers and students. The possible explanation for low incidence in farmer in our study is explained by the fact that most of the patients in the present study are from urban areas. Poverty and inadequate income to run the family were responsible

for higher incidence of poisoning among laborers in our study. Factors like dowry, cruelty by the in-laws, family quarrels, maladjustment in married life and dependence of women on husband were found to be responsible for the higher incidence of poisoning among house wives or married females. Failures in the exams or inability to cope up the high expectation from parents and teachers, separation/ death of boyfriend/ girlfriend were common reasons of poisoning among students.

As shown in Zaheer et al⁷, incidence of suicidal poisoning was higher in this study also. Common agents involved in poisoning incidents were household products, agrochemicals, pharmaceuticals as well as plants and traditional medicines which were comparable to Malangu et al.¹⁴ Prajapati et al¹⁵ also reported household chemicals as the second most common toxic agents abused in poisonings in Ahmedabad with the highest mortality. As most common route of poisoning was oral so common symptoms on admission were nausea, vomiting and abdominal pain in our study.

In Henriksson et al¹⁶ alcohol abuse was present in 44% of suicide victims while in ours was 17%. Alcoholics are more likely to have co-morbid mental disorders, antisocial behavior, disturbed family backgrounds and life events. 39% patients had psychiatric illness. Which is correlated with the previous studies by Maskey et al.¹⁷ In Triada E et al¹⁸ psychotropes were the leading cause of poisoning in patients with a psychiatric disease (74.1%). This may be because patients with psychiatric illness have high suicidal thoughts, drug addiction, drug side effect, low self-esteem, inability to cope up with other persons and problems which lead them to attempt suicide.

Mortality rate in acute poisoning was 2%. Higher dose of poisoning substances, hemodynamic instability at time of admission, long window period between time of ingestion of substances and reaching at primary care center were responsible for mortality in our study. Lin CJ, Wei Z et al.¹⁹ showed that emergency green channel plays an important role in improving the quality of acute poisoning treatment.

Conclusion: Incidence of poisoning is dependent on various factors such as age, sex, residential area and occupation. Outcome of poisoning also depends on type of poisoning, dose of poisoning & availability of

health care services. Psychological assessment, social and economic security may be helpful to prevent incidence of suicidal poisoning.

This study also had some limitations. Owing to small sample size, it was not possible to determine the exact incidence of poisoning. Patients with snake bite, insect bite, food poisoning and allergic reaction to drugs were excluded from the study. As the study was performed at a tertiary care centre at an urban area, incidence of poisoning rural area could not be correctly determined. Thus, a large, multicentric study involving both urban and rural population would be more conclusive.

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