

# Clinical profile and immediate outcome of acute poisoning in children admitted to RIMS teaching hospital

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## Abstract

**Background:** Acute poisoning is an important and common pediatric emergency in developing countries. Poisoning in children is one of the most common emergencies encountered in pediatric practice, but most of the poisoning in children is accidental and are preventable. Present study intended to know the various epidemiological factors like age, sex, demography, socioeconomic factors involved in the poisoning of children at a tertiary care teaching hospital situated in northern part of Karnataka. **Material and Methods:** Present study was conducted in patients with poisoning cases due to ingested poisons or due to snake, insect and unknown bites. **Results:** During study period, 80 children were admitted with history of poisoning cases due to ingested poisons or due to snake, insect and unknown bites. Most of patients were from 1-5 years age group (53.75 %) followed by 6-9 years (30 %). Boys (61.25 %) were more than girls (38.75 %) with boys : girls ratio of 1.6:1. In present study most common symptoms were vomiting (61.25 %), drowsiness/altered sensorium (26.25 %), seizures (22.5 %), respiratory distress (13.75 %) while 11.25 % patients were asymptomatic. Most common route of administration was oral (86.25%). Common causative substances in present study were unknown substances (21.25 %), kerosene (15 %), insecticides (15 %), unknown seeds (15 %), envenomation (12.5 %) and bleaching solution (10 %). Aspiration pneumonia (16.25 %), respiratory failure (11.25 %), shock (6.25 %) and DIC/renal failure (3.75 %) were complications noted in children in present study. Most of patients required no treatment (46.25 %), while rest patients required oxygen (45 %), antibiotics (43.75 %), gastric lavage (20 %), atropine (10 %), Mortality was noted in 3 children. **Conclusion:** Keeping medicines in child-proof containers and careful storage of common household products implicated in pediatric poisoning under lock and key may reduce such poisoning to a great extent. **Keywords:** acute poisoning, snake bite, envenomation, insecticide

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## INTRODUCTION

Acute poisoning is an important and common pediatric emergency in developing countries. Increasing morbidity

and mortality due to acute poisoning in children is a serious emerging challenge to pediatricians. Poisoning account for 1- 6% of bed occupancy in children hospitals and 3.9% in the pediatric intensive care unit in India.<sup>1,2</sup> The most common agents involved are over-the-counter (OTC) medications, prescription medications, household products, paraffin/kerosene, pesticides, poisonous plants and animal or insect bites.<sup>3</sup> Rapid industrialization and exposure to harmful chemicals, introduction of newer range of drugs, massive use of pesticides for agriculture have widened the spectrum of toxic products to which people are exposed. Children also differ in their ability to metabolize toxins and may be more susceptible to effect of poisons in environment.<sup>4</sup> Apart from ingested poisoning, poisoning also may be due to animal bites, especially snake

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bite, which is a common medical emergency, more so in tropical India where farming is a major source of employment. The cause and type of poisoning varies in different parts of the world and within the country also depending upon factors such as demography, socioeconomic factors, education, local belief, customs and availability of poisonous substance. Poisoning in children is one of the most common emergencies encountered in pediatric practice, but most of the poisoning in children is accidental and are preventable. Present study intended to know the various epidemiological factors like age, sex, demography, socioeconomic factors involved in the poisoning of children at a tertiary care teaching hospital situated in northern part of Karnataka.

### MATERIAL AND METHODS

Present study was hospital based, prospective and observational study conducted for the study period of 24 months (from 1<sup>st</sup> December 2019 to 30<sup>st</sup> November 2020). Study was conducted in department of paediatrics at Raichur Institute of medical sciences, Raichur, India. Study was approved by institutional ethical committee.

Broadly the patients will be divided into two groups:

1. Poisoning cases due to ingested poisons.
2. Poisoning cases due to snake, insect and unknown bites.

Poisoning due to ingested poisons:

#### Inclusion criteria:

- a. All patients less than 14 years of age who come with history of poison consumption, irrespective of presence of signs and symptoms, accompanied or unaccompanied by container or poison.
- b. Patients with doubtful history of consumption of poison but with definite signs and symptoms of acute poisoning.

#### Exclusion criteria

- a. Food poisoning

- b. Idiosyncratic reactions to drugs

Poisoning due to snake, insect and unknown bites:

#### Inclusion criteria

- a. All patients less than 14 years of age with history of bites having positive and significant signs and symptoms due to snakes, scorpions, bees and insects.
- b. Patients with doubtful history of bites due to poisonous creatures but with definite acute onset of signs and symptoms locally or systemically.

#### Exclusion criteria

Patients with doubtful history of bite but having no symptoms either locally or systemically. Consent for participation was taken from parents/guardians. Patients admitted with history of acute poisoning were studied and details such as age, sex, socio demographic data, type of poisoning agent, Route of exposure, Date, time and place of poisoning, Time of arrival to hospital after poison exposure, Manner of poisoning were noted. In case of bites/stings, details about the type of snake or insects, site of bites and the time of bite will be noted. Routine hematological investigations (CBC, LFT, KFT, PT, aPTT, INR, sr electrolytes, sr. cholinesterase) were done. X ray chest, gastric aspirate, urine, cerebrospinal fluid investigations conducted as per requirement whenever needed. Clinical examination for vital signs like pulse rate, respiratory rate, temperature, blood pressure, level of consciousness, the state of the eyes, pupils, tongue and skin, presence of any suicidal or homicidal injuries over the body was done. A thorough systemic examination of cardiovascular system, respiratory system, abdomen and central nervous system was done.

Standard treatment was provided according to the individual cases. Psychiatric counseling was done for suicidal intended poisonings. Immediate outcome of the cases was noted in term of discharge or death. Data was collected and compiled using Microsoft Excel and statistical analysis was done using descriptive statistics.

### RESULTS

During study period, 80 children were admitted with history of poisoning cases due to ingested poisons or due to snake, insect and unknown bites. Most of patients were from 1-5 years age group (53.75 %) followed by 6-9 years (30 %). Boys (61.25 %) were more than girls (38.75 %) with boys : girls ratio of 1.6:1.

Table 1: Age and gender distribution

| Age(Year)        | Male (%)     | Female (%)   | Total (n=80) (%) |
|------------------|--------------|--------------|------------------|
| <1               | 1 (1.25 %)   | 2 (2.5 %)    | 3 (3.75 %)       |
| 1-5              | 26 (32.5 %)  | 17 (21.25 %) | 43 (53.75 %)     |
| 6-9              | 15 (18.75 %) | 9 (11.25 %)  | 24 (30 %)        |
| 10-13            | 7 (8.75 %)   | 3 (3.75 %)   | 10 (12.5 %)      |
| Total (n=80) (%) | 49 (61.25 %) | 31 (38.75 %) | 80               |

In present study most common symptoms were vomiting (61.25 %), drowsiness/altered sensorium (26.25 %), seizures (22.5 %), respiratory distress (13.75 %) while 11.25 % patients were asymptomatic.

**Table 2:** Presenting features

| Presenting features          | Number (n=80) | Percentage |
|------------------------------|---------------|------------|
| Vomiting                     | 49            | 61.25      |
| Drowsiness/altered sensorium | 21            | 26.25      |
| Seizures                     | 18            | 22.5       |
| Respiratory distress         | 11            | 13.75      |
| Asymptomatic                 | 9             | 11.25      |
| Hematemesis                  | 4             | 5          |

Most common route of administration was oral (86.25%).

**Table 3:** Distribution of the poisoning cases according to the route of administration.

| Route of administration | Number (n=80) | Percentage |
|-------------------------|---------------|------------|
| Oral                    | 69            | 86.25      |
| Bites                   | 10            | 12.5       |
| Inhalation              | 1             | 1.25       |

Common causative substances in present study were unknown substances (21.25 %), kerosene (15 %), insecticides (15 %), unknown seeds (15 %), envenomation (12.5 %) and bleaching solution (10 %).

**Table 4:** Causative agents for poisoning

| Substance           | Number (n=80) | Percentage |
|---------------------|---------------|------------|
| Household liquids   |               | 0          |
| Kerosene            | 12            | 15         |
| Unknown seeds       | 12            | 15         |
| Bleaching solution  | 8             | 10         |
| Hair dye            | 2             | 2.5        |
| Massage oil         | 1             | 1.25       |
| Insecticides        |               | 0          |
| Organophosphorous   | 4             | 5          |
| Carbamates          | 3             | 3.75       |
| Pyrethroids         | 2             | 2.5        |
| Laxman Rekha        | 2             | 2.5        |
| Orgnochlorine       | 1             | 1.25       |
| Envenomation        |               | 0          |
| Snake bite          | 3             | 3.75       |
| Scorpion bite       | 2             | 2.5        |
| Unknown insect bite | 5             | 6.25       |
| Medicines           |               | 0          |
| Iron tablets        | 3             | 3.75       |
| Unknown tablets     | 2             | 2.5        |
| Others              |               | 0          |
| Unknown             | 17            | 21.25      |
| Tobacco             | 1             | 1.25       |

Aspiration pneumonia (16.25 %), respiratory failure (11.25 %), shock (6.25 %) and DIC/renal failure (3.75 %) were complications noted in children in present study.

**Table 5:** Complications associated with poisoning.

| Complications                                      | Number (n=80) | Percentage |
|--|---------------|------------|
| Aspiration pneumonia                               | 13            | 16.25      |
| Respiratory failure                                | 9             | 11.25      |
| Shock  | 5             | 6.25       |
| Aspiration pneumonia + respiratory failure         | 4             | 5          |
| DIC/renal failure                                  | 3             | 3.75       |
| Aspiration pneumonia + respiratory failure + shock | 2             | 2.5        |

Most of patients required no treatment (46.25 %), while rest patients required oxygen (45 %), antibiotics (43.75 %), gastric lavage (20 %), atropine (10 %),

**Table 6: Treatment required**

| Treatment        | Number (n=80) | Percentage |
|------------------|---------------|------------|
| None             | 37            | 46.25      |
| Oxygen           | 36            | 45         |
| Antibiotics      | 35            | 43.75      |
| Gastric lavage   | 16            | 20         |
| Atropine         | 8             | 10         |
| Ventilatory care | 7             | 8.75       |
| Pralidoxime      | 4             | 5          |
| Antisnake venom  | 3             | 3.75       |

Mortality was noted in 3 children.

**Table 7: Outcome of children**

| Outcome   | Number (n=80) | Percentage |
|-----------|---------------|------------|
| Discharge | 71            | 88.75      |
| Mortality | 3             | 3.75       |
| DAMA      | 6             | 7.5        |

## DISCUSSION

Despite major advances in promoting and maintaining good health, unintentional pediatric injuries including acute oral poisoning and continues to be leading pediatric health problem partly because of their developmental process and inquisitiveness.<sup>5,6</sup> Acute childhood poisoning is an important cause of morbidity and mortality in children, which can be significantly and effectively controlled by preventive measures. Young children, due to their curious nature, close position to the floor and tendency to put things in their mouths are often victims of accidental poisoning.<sup>7</sup> Although pediatric poisonings are considered emergencies, more than 85% of cases need no medical intervention because the ingested material is not toxic or the amount swallowed is not clinically significant.<sup>8</sup> Tarvadi PV *et al.*,<sup>9</sup> studied 214 cases of poisoning in children from Mangalore and observed that 33% of the victims were in age group less than 5 years and most common route of exposure was ingestion seen in 84%. Most common substance used was insecticide which was seen in 40.2% and mortality was seen in 4.7%. Similar findings were noted in present study. In study by Vasavada H *et al.*,<sup>10</sup> with 176 cases aged less than 15 years, they noted that accidental poisoning was found in 98.59% and overall mortality was 5.1%. 87.5% were less than 5 years old. Snake bite was seen in 2.27% and unknown insect bite was seen in 3.97%. Randev S *et al.*,<sup>7</sup> studied 263 cases less than 17 years of age in Chandigarh, among which 56.82% were due to organo phosphorous poisoning and overall mortality was 3.8%. 84.93% were from rural area and 75.34% were due to accidental cause. Lin YR *et al.*,<sup>11</sup> noted that incidence of poison exposure was highest among adolescents and preschool age children and the most common location of poison exposure was home which was seen in 85%. The major reason of poison exposure was accidental which was found in 61.4%. The most common

symptom seen was neurological as in 34.3% followed by gastrointestinal seen in 25%. Budhatoki S *et al.*,<sup>12</sup> noted that organophosphorus poisoning was the most common poisoning seen in 45.1% followed by hydrocarbon 9.8%, scorpion sting was seen in 1.6% and overall survival was 87.4%. Gupta SK *et al.*,<sup>13</sup> studied 995 cases from 1-18 years of age and concluded that 79.69% were accidental and the route of exposure was oral in 96.78%. 47.03% were due to household products among which the commonest agents involved were Pyrethroids as seen in 20.29%. Bites and stings were seen in 3.21%. Variation in the manifestations of symptoms following acute pesticide poisoning depends on the type and quantity of the poison ingested. Deliberate self-harm is not uncommon in adolescents age group, suicide or deliberate self-harm in >15 years of age group accounts for more than 3% of total deaths amounting up to 187,000 events in India.<sup>14</sup> Interventions aimed at suicide attempters will, therefore, be a logical strategy for the prevention of deaths due to deliberate self-harm. Children over 5 years are at risk of snake bite because they are involved more in outdoor games. Most cases of snake bite occurring in rainy season and the incidence varies in India due to different pattern of rainfall and agricultural activities.<sup>15</sup>

## CONCLUSION

Parental awareness and education are important measures to prevent accidental poisoning in children. Keeping medicines in child-proof containers and careful storage of common household products implicated in pediatric poisoning under lock and key may reduce such poisoning to a great extent.

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