

A HOSPITAL BASED PROSPECTIVE STUDY TO ASSESS THE CORRELATION OF CLINICO-EPIDEMIOLOGICAL PROFILE OF CHILDREN WITH IMMEDIATE OUTCOME OF ACUTE POISONING IN CHILDREN AT A TERTIARY CARE CENTER

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Abstract

Background: Acute poisoning is one of the major medical emergencies with significant morbidity and mortality. Children are curious, so there is always a risk that they open, eat and drink any substance whichever comes into their reach. The aim of this study to assess the correlation of clinico-epidemiological profile of children with immediate outcome of acute poisoning in children at our center. **Materials & Methods:** A hospital based prospective study done on 100 children admitted to Pediatric ward were strongly suspected or proven to suffer with acute poisoning at department of Pediatrics J.L.N. Hospital, a tertiary care medical centre attached to J.L.N Medical College Ajmer, Rajasthan during one year period. Patient's bio data, detailed history, type and nature of poisoning, associated psychological factors and clinical features, course and outcome of acute poisoning in the children. **Results:** The mean age of subjects in this study was 10.99 years. 53% of the children were in the 12-18 years group. There was a predominance of female gender with 53% vs 47% males. In the current study, 64% of the children were admitted between 4-6 hours of poison ingestion. Correlation between Intervention done before transport to institute and outcome was statistical non-significant (P=0.2497). Out of these, three unconscious patients could not survive while 86/97 (88.66%) patients survived who were conscious and oriented. This association was observed to be statistically highly significant (p<0.0001). 8 out of the 14 deaths were caused by rat poisoning and 5 by OPC. 1 subject died due to ingestion of toilet cleaner. There were no deaths among the other categories. **Conclusion:** We concluded that the study showed that initiation of early resuscitative measures and organ support can help to reduce the mortality of the poisoning patients.

INTRODUCTION

Acute poisoning is one of the major medical emergencies with significant morbidity and mortality. Most of the poisoning is due to the intention of deliberate self-harm.^[1] Accidental and occupational exposures to the pesticides leading to acute or chronic poisoning have been seen in farmers and children. The World Health Organization (WHO) have reported that around 0.3 million people die due to the various acute poisoning annually, out of which 200000 deaths are due to organophosphorus poisoning alone.^[2,3] The incidence is much higher in the developing and resource-limited countries. Agricultural pesticides such as organophosphorus, organochloride, zinc, and aluminum phosphide are

commonly used substances for intentional or accidental poisoning in Asian countries due to their easy availability while the misuse of the drugs such as paracetamol, opioids, benzodiazepines, and tranquilizers is commonly seen in industrial and developed countries.^[4,5]

Epidemiological factors such as geography, occupation, socioeconomic status, literacy rate, and cultural and religious practices can influence the clinical presentation and outcome of the poisoning patients. This urges the need for periodical study for understanding the pattern of poisoning in a specific geographical area. Children are curious, so there is always a risk that they open, eat and drink any substance whichever comes into their reach. Childhood poisoning involves a complex interplay of

factors related to the child, toxic substance, environment, family behaviour and/or access to health services. Thus, prevention requires greater knowledge about the specific conditions involved in childhood poisoning.^[6-8] Despite numerous educational and public health campaigns aimed at avoiding childhood poisoning, poisoning remains the most common medical emergency among children. Children are more susceptible to serious injuries relative to adults due to their immature psychological and physical systems, lack of hazard awareness, and poor safety awareness and defense against poisons. The aim of this study to assess the correlation of clinico-epidemiological profile of children with immediate outcome of acute poisoning in children at our center.

MATERIALS AND METHODS

A hospital based prospective study done on 100 children admitted to Pediatric ward were strongly suspected or proven to suffer with acute poisoning at department of Pediatrics J.L.N. Hospital, a tertiary care medical centre attached to J.L.N Medical College Ajmer, Rajasthan during one-year period.

Exclusion Criteria

1. Children admitted with food poisoning
2. Doubtful history not corroborating with clinical features and course of illness.
3. Parents not giving consent for the study.
4. Envenomation like snake bite, scorpion bite, bee sting, etc.

Methods

Data collection and recording was done by using a semi-structured proforma to obtain the socio-demographic variables, Socio economic status was classified according to Modified Kuppuswamy SE scale. Patient's bio data, detailed history, type and nature of poisoning, associated psychological factors and clinical features, course and outcome of acute poisoning in the children. All efforts were made to identify the exact nature of poisoning in suspected cases. Thorough general, physical and systemic examination including assessment of altered sensorium using Glasgow Coma Scale was done.

Respiratory failure occurs when oxygenation and ventilation are insufficient to meet the metabolic demands of the body. Although Respiratory failure is traditionally defined as respiratory dysfunction resulting in arterial partial pressure of oxygen (PaO₂)

<60mm Hg when breathing room air and PaCO₂>50mm Hg, resulting in respiratory acidosis.

Statistical Analysis

Data entry and Statistical Analysis was performed with the help of Microsoft Excel and SPSS version 22.0 (IBM Statistics Inv. Chicago, Illinois, USA). Chi square test was applied for categorical variables and student's T-test for quantitative variables. Comparison and level of significance was determined based on p value; if p <0.05, it was considered as statistically significant.

RESULTS

The mean age of subjects in this study was 10.99 years. 53% of the children were in the 12-18 years group. There was a predominance of female gender with 53% vs 47% males. More than 80% of the study population belonged to the lower and lower middle class.

In the current study, 64% of the children were admitted between 4-6 hours of poison ingestion [Table 1]. Correlation between Intervention done before transport to institute and outcome was statistically non-significant [Table 2].

Out of 100 Cases 97 Cases were conscious and orientated. Out of these, three unconscious patients could not survive while 86/97 (88.66%) patients survived who were conscious and oriented. This association was observed to be statistically highly significant (p<0.0001) [Figure 1].

Our study showed that 8 out of the 14 deaths were caused by rat poisoning and 5 by OPC. 1 subject died due to ingestion of toilet cleaner. There were no deaths among the other categories [Table 3].

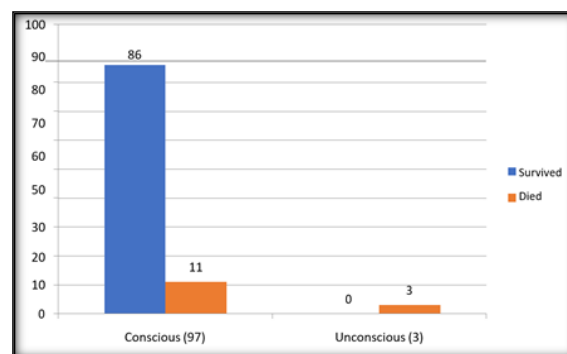


Figure 1: Orientation based outcome analysis

Table 1: Correlation between Time of Admission and Outcome

| Time of Admission after Poisoning | Outcome | |
|-----------------------------------|------------|---------------|
| | Death (14) | Survived (86) |
| <2 hours (2) | 0 | 2 |
| 2 to <4 hours (22) | 3 | 19 |
| 4-6 hours (64) | 9 | 55 |
| >6 hours (12) | 2 | 10 |
| Chi square value | 0.658 | |
| P value | 0.720 | |

Table 2: Correlation between Intervention done before transport to institute and Outcome

| Intervention done before transport to institute | Outcome | |
|---|------------|----------|
| | Death | Survived |
| Gastric Lavage (51) | 6 | 45 |
| Antidotes (1) | 0 | 1 |
| No treatment (48) | 8 | 40 |
| Chi square value | 2.775 | |
| P value | 0.2497(NS) | |

Table 3: Co-relation between Outcome of treatment and Type of Poison

| Poisonous Agents | | Outcome of Treatment | |
|-------------------------|----------------------|----------------------|------------|
| | | Survived (86) | Death (14) |
| Insecticides (53) | Carbamates (1) | 1 | 0 |
| | OPC (47) | 42 | 5 |
| | Organochloride (3) | 3 | 0 |
| | Cypermethrin (2) | 2 | 0 |
| Household Products (20) | Rat Poison (16) | 8 | 8 |
| | Ant killer Chalk (4) | 4 | 0 |
| Hydrocarbons (14) | Kerosene (1) | 1 | 0 |
| | Turpentine oil (12) | 12 | 0 |
| | Paint thinner (1) | 1 | 0 |
| Corrosive (7) | Phenyl (5) | 5 | 0 |
| | Toilet Cleaner (2) | 1 | 1 |
| Plants (3) | Dhatura (2) | 2 | 0 |
| | Oleander (1) | 1 | 0 |
| Drugs (3) | Anti-convulsant (1) | 1 | 0 |
| | Unknown drugs (1) | 1 | 0 |
| | Tab PCM (1) | 1 | 0 |
| Total | | 100 | 100% |

DISCUSSION

Acute poisoning is a major health-care problem with a significant morbidity and mortality. It is a common medical emergency in the East Asian subcontinent where pesticides and insecticides are in easy access to the population. The prompt diagnosis and appropriate management is necessary for better outcome. However, the diagnosis and management can be challenged and complicated by the wide variation in the pattern of poisoning which depends on the various factors such as geographical area, socioeconomic status, literacy rate, age, and presence of various comorbid conditions.^[9,10]

The mean age of subjects in this study was 10.99 years. The higher age range noted in this study could be due to the higher proportion of teenagers in paediatric population and this can be simple regional variation. More than 80% of the study population belonged to the lower and lower middle class. Because parents of lower socioeconomic group are mostly of time engaged for the livelihood and unable to spare adequate time for the care of their children. Regarding time of admission into hospital since poison ingestion, there is variation among different studies. In the current study, 64% of the children were admitted between 4-6 hours of poison ingestion. The study by Sil A et al.^[11], reported that 70% of children were admitted after 3 hours of poisoning ingestion. Jayashree et al.^[12], and Kohli et al.^[13] reported that 75% of the poisoned subjects were admitted within 1 hour of poison ingestion. Awareness of the seriousness of the condition, onset and presentation of symptoms, presence of family members at the time of poisoning and access to healthcare are determining

factors for timely admission to the hospital. The patients presenting to the first health-care service within 2 h of acute poisoning have least morbidity and mortality.^[14] The delayed presentation of the patients in our study might be due to the various reasons such as delayed recognition of the victim after ingestion of the poison, difficult access to the transport facility, or difficult access to the health-care centers. Delayed presentation after 4 h was also found by the work done by Ahuja *et al.* where they had mentioned that delayed initiation of resuscitative measures could be the possible contributing factor for the high mortality in their subjects.^[15]

The death rate or mortality was low in the present study 14% while 86% survived. Most of the reported studies show a survival rate of greater than 90%. Our study did not classify the rural or urban population, but most studies have reported a higher death rate in the rural subjects due to poor access to hospital care, less awareness and delay in admission.

A study done by Mathai and Bhanu had demonstrated that factors responsible for poor prognosis were delayed presentation, early evidence of organ failure, acidosis, and need for vasoactive drugs for hemodynamically unstable patients.^[16] Ahuja et al.^[15] had demonstrated higher mortality of the patients with high APACHEII score and high SOFA score. In the same study, higher mortality was also observed in patients requiring mechanical ventilation and vasoactive support.

CONCLUSION

We concluded that mortality is determined by the age of the patients, delayed presentation to the hospital,

evidence of organ failure, need for mechanical ventilation, prolong duration of hospital stay, need for vasoactive drugs, and hepatic failure with coagulopathy. Hence, the study showed that initiation of early resuscitative measures and organ support can help to reduce the mortality of the poisoning patients.

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