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ORIGINAL ARTICLE

PATTERN AND OUTCOME OF POISONING IN CHILDREN: A STUDY FROM A RURAL TEACHING HOSPITAL, WESTERN MAHARASHTRA, INDIA

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ABSTRACT

Background: Acute poisoning is a common cause for morbidity and mortality in children. The profile and outcome in children with acute poisoning depend a lot on the socioeconomic status, cultural practices, parental education status and availability of health care. The present study was aimed to analyze the pattern and outcome of pediatric poisoning in rural area.

Methodology: This is a retrospective study, conducted over a period of twenty-four months in a rural hospital attached to medical college.

Results: The poisoning constituted 4.7% of total admissions in Pediatric Intensive Care Unit (PICU). Male: Female ratio was 1:33. 98(87.5%) of children were less than 5 years of age. Organophosphorus compounds were most commonly (n=55, 49.1%), responsible for poisoning, followed by kerosene (n=20, 17.9%). Thirty percent children had short stay in hospital i.e., less than 48 hours. Overall survival rate noted in the study was 91% (n=103).

Conclusion: Poisoning in Pediatric age contributes to significant number of admissions to Pediatric Intensive Care Unit in rural area. Insecticide/Pesticides, Kerosene, and plants were leading causes of poisoning.

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Introduction

Accidental poisoning in children is often an emergency. It is accidental in most cases. It constitutes to be an important cause for hospitalization and morbidity. A poison is any substance, including drugs, that have entered in body by whatever route, which has harmful effects on the body.[1] In developed country like USA more than half of the registered cases of poisoning were children <12 years age group.[2] There is lack of authentic data from India, but various studies conducted in different part of India have reported 1 to 7.6% admission rate and mortality ranging from 0.6% to 11.6% due to acute poisoning in children.[3,4,5,6,7]

Pattern and outcome of acute poisoning varies according to demography, the nature, and dose of the poison and type of exposure. In developed nations and urban area, poisoning due to drugs is more commonly seen.[8,9] In contrast; household substances are major agents in low income / rural areas. Some studies have shown that hospital admissions with poisonings are seen more in rural compared to urban areas.[10,11] Conversely, many other studies report admissions due to poisoning in children more from urban areas.[9,12]

Cases of acute poisoning in children are often under-reported from rural areas. Our study aimed to determine the pattern and outcome of poisoning in children under the age of 12 years at a rural based hospital attached to medical college in Western Maharashtra, India.

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Methods & Materials

This record-based study was conducted in the pediatric intensive care unit (PICU) of a Rural Hospital over a period of 2 years from January 2017 to December 2018 after obtaining Institutional Ethics Committee clearance. Study subjects were taken as children with a history of consumption of unknown or harmful substance. The children who were excluded from the study were those with chronic poisonings like lead poisoning, foreign body ingestion, food poisonings and homeopathic drug ingestion. All the children were admitted initially in PICU.

They were monitored regularly until the outcome and treated as per protocol. The required information such as demography, the type of poison, clinical course and outcome was noted. The data was recorded in a data collection form and analyzed on Microsoft Excel spreadsheet. Descriptive statistics was used to study the frequency and percentage.

Results

Incidence of poisoning

During the study period of 2 years i.e., from January 2017 to December 2018; 112 out of total 2386 admitted children had exposure to alleged poisoning agents, which accounted for 4.7% of admissions. There was a decline in the percentage of admissions due to poisoning seen in the year 2018 compared to the previous year [Table 1].

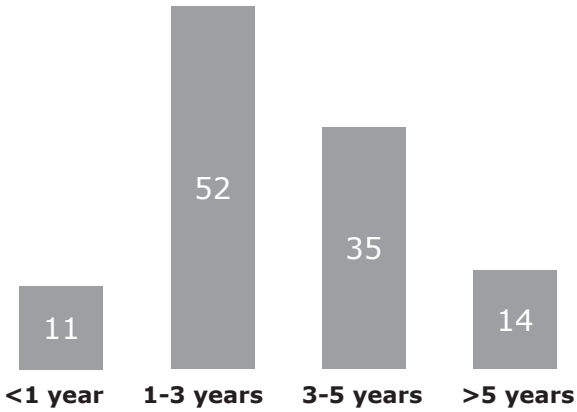
Table 1. Poisoning cases among total admissions during study period.

Duration/ Year	Total number of cases	Number of poisoning cases (%)
2017	1051	55 (5.33%)
2018	1335	57 (4.27%)
Total	2386	112 (4.7%)

Age and gender variation

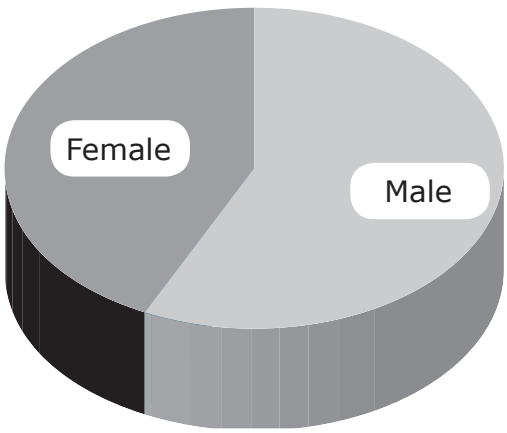
Mean age of patients was 3±2.2 years with youngest patient being 5 month old and oldest was 12 years of age. Majority of the children were toddlers (n=52,46.4%). 9.82% were infants, 31.25% belong to age-group 3-5 years, and 12.5% were above 5 years.

Figure 1. Age-wise distribution.



Amongst admitted cases of poisoning 64 (57.1%) were males and 48 (42.9%) were females as shown in Figure 2.

Figure 2. Gender-wise distribution of cases.



Types of poison ingested

Poisoning due to ingestion of insecticide/pesticide was observed in more than half of the cases (n=59, 52.7%), followed by exposure to hydrocarbon (n=23, 20.6%). Other agents of poisoning are listed in Table-2.

Table 2. Agents implicated in pediatric poisoning (n=112).

Poisoning agent	No. of patients (%)	Sex distribution (M/F)
HYDROCARBONS		
Kerosene	20	10/10
Other	03	03/00
INSECTICIDE AND PESTICIDE		
OP Compound	55	34/21
Other	04	03/01
Plant poisoning	14	05/09
Drugs	04	01/03
Others	07	06/01
Unknown	05	02/03

Month wise distribution of admitted cases during study period has been shown in Figure-3. The cases were observed throughout the year, but more number of cases were noted in the month of February and October in year 2018.

Figure 3. Monthwise distribution of cases.

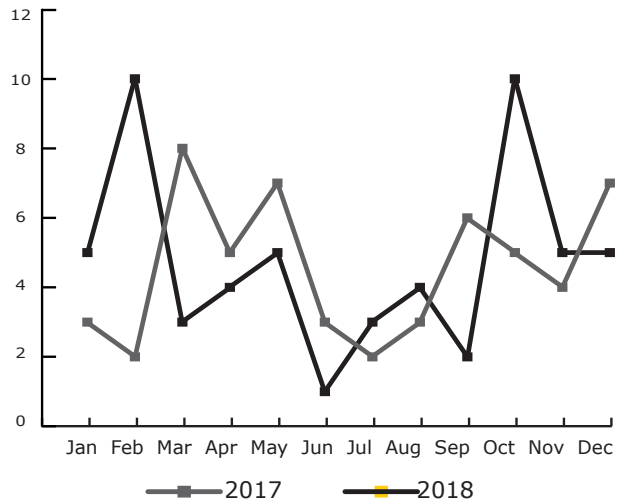


Table 3. Patient distribution according to type of poison and season [N=112].

Type of poison	Winter (Oct-Jan)	Summer (Feb-May)	Monsoon (Jun-Sep)	Total
OP Compounds	27	18	14	59
Hydrocarbon	06	14	03	23
Plants	02	09	03	14
Others	09	03	04	16

Duration of hospital stay ranged from 3 hours to 20 days. Maximum cases stayed in hospital for 2-4 days, 33 cases (29.5%) stayed in hospital for <2 days and 16 cases stayed >4 days as shown in Table 4.

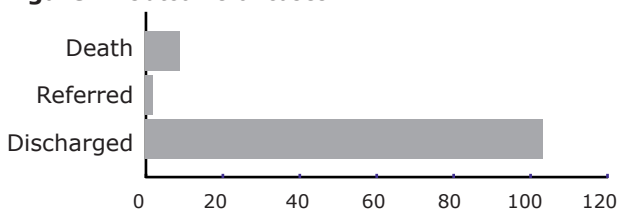
Table 4. Duration of Hospital Stay.

Duration	Number	Percentage
0-2 days	33	29.5
2-4 days	63	56.3
>4 days	16	14.3

Poisoning outcome

Outcome of the disease was assessed in terms of discharge, referral, and death. 91% (n=103) of the children with acute poisoning were discharged, a child was referred for renal replacement therapy and death occurred in nine (8%) cases.

Figure 4. Outcome of cases.



Discussion

We have described the pattern of acute childhood poisoning in PICU of a hospital situated in rural part of Maharashtra. In our study, 4.7% of total PICU admissions were due to poisoning during the study period. The contribution of acute poisoning cases to total admissions PICU is comparable to earlier studies conducted in various part of India.[6,13,14] The lower figures also have been reported.[5,15,16] They may be due to taking total pediatric admissions as denominator.

In the present study, children between 1 to 3 years were most commonly involved, followed by 3 to 5 years of age group. This finding is consistent with most of the other studies from India.[17,18] Children less than 5 years was the most vulnerable age group for accidental poisoning. It could be due to inquisitiveness and inability to differentiate between harmful and harmless things.

Our study showed male preponderance; similar to earlier studies.[3,17,18] Male preponderance can be attributed to difference in socialization practices for male and female in rural areas.

Insecticide/pesticide were the most common agents in this study, as these agents are used commonly for agricultural purpose and there are poor storage facilities for these agents. Similar observation has been reported.[4,19] After insecticides/pesticide, kerosene was found to be common agent in our study. This can be attributed to the use of kerosene oil as a cooking fuel especially in lower income/agricultural families, its storage in easily accessible places or indiscriminately in empty soft drink bottles, and its colour which is often mistaken for soft drink. Kerosene was major household product implicated in earlier studies.[14,15]

Cases were seen throughout the year; more cases were seen at the end of rainy season. There was a seasonal variation in the incidence of accidental kerosene oil ingestion; similar to earlier studies.[6,14] More case during summer can be attributed to use/storage of kerosene oil following frequent power cuts during summer months in rural areas.

Duration of hospital stay ranged from 3 hours to 20 days. 33 cases (29.5%) stayed in hospital for less than 2 days. 16 cases (14.3%) stayed in hospital for more than 4 days. Majority of the cases in the present study had hospital stay less than 4 days.

Out of 112 cases of poisoning 102 (91%) cases recovered. The overall burden of mortality in our study was 8%. Similar rate of mortality has been reported.[4,20] Among 9 cases of death, two-third cases were due to poisoning with insecticide/pesticide ingestion (organophosphorus compound). Mortality was higher in children below five years of age.

Limitations: This study was restricted to a health facility attached to rural medical college and we could not trace cases presented in nearby health facilities thus, this may underestimate the true rate of paediatric poisoning in local community. We could not assess the risk factors for poisoning.

Conclusion

We conclude that accidental poisoning was more in children below five years of age. Insecticides/ pesticides and Kerosene were the most common agents contributed to hospital admission with poisoning. Preventive measures such as careful storage of common household products found to be responsible for poisoning in children, keeping the hazardous substance out of reach for children and not leaving the children unattended might contribute to the reduction of incidence.

Compliance with Ethical Standards

Funding: None
Conflict of Interest: None

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