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Research Article

Clinical profile and outcome of poisoning in pediatric age group at a tertiary care teaching hospital, Mandya, Karnataka, India

Sridhar PV*, Sandeep M., Thammanna PS

Department of Pediatrics, Mandya Institute of Medical Sciences, Mandya, Karnataka, India

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***Correspondence:**
Dr. Sridhar PV,
E-mail: drsridharpv@gmail.com

ABSTRACT

Background: Poisoning causes considerable morbidity and mortality worldwide. Most of the poisoning in children is accidental and most cases are preventable. The profile and outcome of poisoned patients vary from place to place. Objective was to study the profile and outcome of poisoning in Pediatric age group.
Methods: A 2 year retrospective study of Pediatric poisoning cases at Mandya Institute of Medical Sciences, Mandya from August 2013 to July 2015 was conducted; data was collected in predesigned proforma and analyzed.
Results: Poisoning patients constituted 5.667% of all Pediatric admission, Male: Female ratio was 1.24: 1, 157 (62.06%) were from rural area, 139 (54.94%) of children were of the age 1- 4 years. Most of poisoning happened in home environment (n= 216, 85.38%), majority were accidental poisoning (n= 217, 85.77%), kerosene (n= 89, 35.18%) was the most common compound responsible for poisoning, followed by drugs (n= 38, 15.02%). 142 (56.13%) children were discharged within 24 hours of admission, overall survival rate noted in the study is 98.81% (n= 250).
Conclusions: Incidence of poisoning in Pediatric age has remained same. Kerosene, drugs and pesticides continue to be leading causes of poisoning. Child under the age of <5 years are most vulnerable. Following measures may help in reduction of Pediatric poisoning: educating the parents, storage of poisonous substances at a safe place and their proper disposal, providing basic health education to children.

Keywords: Poisoning, Pediatric age, Kerosene, Outcome

INTRODUCTION

Poisoning causes considerable morbidity and mortality worldwide. Poisoning can be defined as taking or exposure to a substance or substances which are injurious to a person's health.[1] Irrespective of circumstances of poisoning the victim can be of any age group ranging from an infant to elderly.[2] Poisoning cases can be deliberate or accidental. Poisoning in children is one of the most common emergencies encountered in pediatric practice and it is a worldwide problem leading to morbidity and mortality.[3] Most of the poisoning in children is accidental, and most cases of accidental poisoning are preventable.[4] Most exposures among children are often unintentional.[5] Intentional poisoning becomes more likely in adolescent age group.[6]

Children are curious and explore their world with all their senses, including taste. As a result, the home and its surroundings can be a dangerous place when poisonous substances are inadvertently ingested.[7] In majority of the cases, accidental poisoning in children is due to oral ingestion of poisonous substances like household products, pesticides, drugs, kerosene, etc. The risk of accidental poisoning is further more when some of these toxic substances are removed from their original containers and stored in drinking water bottles or food containers, these substances are often mistaken by children for water or food and ingested.[8, 9]

The profile and outcome of poisoned patients vary from place to place and is influenced by demography, education, socio economic status, prevalent local

practices and also by available medical care facility. In developed nations presently majority of Pediatric poisoning is due to household non- toxic substances and they are discharged after a brief period of observation in emergency room. Decrease in cases of poisoning related to toxic drugs and chemicals in the developed countries is due to introduction of childproof packs and bottles, measures which are yet to be implemented in developing countries.[10,11] The reported incidence of childhood poisoning in various studies varies from 0.3% to 7.6%.[12,13] In developing countries poisoning due to toxic substances is more common. There are a few studies from South India that describes the profile of poisoning in Pediatric age group.

We planned this study to gather epidemiological data regarding poisoning in children in Mandya, so as to formulate measures that could probably help to reduce the occurrence of poisoning, morbidity and mortality associated with it.

METHODS

Present study was a retrospective research conducted at Mandya Institute of Medical Sciences, Mandya, which is a tertiary care teaching hospital, situated in Mandya, Karnataka. The study involved review of cases of acute poisoning in Pediatric age group (0-18 years) during the period August 2013- July 2015. Data for the study was collected from inpatient records and medico legal case register. Cases with food poisoning, toxic or idiosyncratic reaction to prescribed drugs, snake bites, scorpion sting and bee sting were excluded from the study.

We studied the demographic profile, clinical presentation, treatment methods, and outcome of Pediatric patients who presented with acute poisoning during the study period. Data regarding age, sex, place, socio-economic status (SES), type and quantity of the substance consumed, time of ingestion, nature of ingestion, time of presentation to hospital, symptoms and signs, investigations, diagnostic and therapeutic interventions, and outcome were noted on a predesigned proforma. SES classification of the family was done based on modified Kuppuswamy's classification.[14]

Data thus obtained was compiled and entered in MS Excel spread sheet; descriptive statistics was applied, data was expressed in terms of frequency and percentage.

RESULTS

During study period a total of 451 children with acute poisoning were admitted to hospital, total Pediatric admission during the study period was 7958, poisoning contributed for 5.667% of total admission. 253 cases of acute poisoning were included in analysis after excluding cases with food poisoning, toxic or idiosyncratic reaction to prescribed drugs, snake bites, scorpion sting and bee sting.

Table 1: Socio-demographic profile of study subjects (n= 253).

Characteristics	Frequency (n)	Percentage
Gender of child		
Male	140	55.34%
Female	113	44.66%
Place		
Urban	96	37.94%
Rural	157	62.06%
Age of child		
< 1 year	35	13.83%
1- 4 years	139	54.94%
5- 9 years	38	15.02%
10- 14 years	25	9.88%
> 14 years	16	6.33%
Socio economic status		
Upper	1	0.39%
Upper middle	12	4.75%
Lower middle	69	27.27%
Upper lower	116	45.85%
Lower	55	21.74%

Socio-demographic characteristic of study subjects is summarized in Table 1. Out of 253 poisoning cases 140 were male (55.34%), sex ratio in the study is 1.24 : 1 (Male: Female). Majority of the children with poisoning were from rural area (n= 157, 62.06%). 139 (54.94%) children were of the age group 1-4 years followed by 38 (15.02%) children of age group 5- 9 years. 116 (45.85%) children belonged to class IV SES, 69 (27.27%) were of class III SES.

Table 2: Distribution of cases according to place and type of poisoning (n= 253).

Characteristic	Frequency (n)	Percentage
Place of poisoning		
Indoor	216	85.38%
Outdoor	37	14.62%
Type of poisoning		
Accidental	217	85.77%
Suicidal	34	13.44%
Homicidal	2	0.79%

Most of the poisoning happened in the home environment (n= 216, 85.38%). Most of the cases of poisoning was accidental (n= 217, 85.77%), whereas 34 (13.44%) cases were suicidal poisoning and in 2 (0.79%) cases, children were intentionally poisoned by mother due to domestic problem (Table 2).

Toxic agent responsible for poisoning in various cases is summarized in Table 3, kerosene was the most common compound (n= 89, 35.18%), followed by drugs (n= 38, 15.02%) and Organo phosphorus + Organo chlorine compound (n= 36, 14.23%). In all the cases route of poisoning was by ingestion. In majority (n= 142, 56.13%) of cases with poisoning the child was kept under

observation and discharged within 24 hours. Overall survival rate noted in the present study is 98.81% (n=250) (Table 4).

Table 3: Toxic age involved in poisoning (n=253).

Compound	Frequency (n)	Percentage
Kerosene	89	35.18%
Organo phosphorus + Organo chlorine	36	14.23%
Zinc phosphide	13	5.14%
Mosquito repellant + Lakshman rekha	29	11.46%
Drugs*	38	15.02%
Toilet cleaning acid	11	4.35%
Phenol	4	1.58%
Unknown seeds	21	8.3%
Dhatura	2	0.79%
Thinner	2	0.79%
Eucalyptus oil	4	1.58%
Diesel	1	0.359%
Shampoo	1	0.359%
Vaseline	1	0.359%
Ink	1	0.359%

*Drugs included: Analgesics, iron, lindane, dexamethasone, anti hypoglycemic agent, amitriptyline, risperidone, phenobarbitone, qutiapine, furosemide, carbamazepine, doxycycline.

Table 4: Outcome of poisoning cases (n=253).

Parameter	Frequency (n)	Percentage
Duration of stay		
< 1 day	142	56.13%
1-3 days	81	32.01%
>3 days	30	11.86%
Outcome		
Survived	250	98.81%
Death	3	1.19%

DISCUSSION

Acute poisoning in children is one of the common emergency encountered in Pediatric practice, in most of the cases it is preventable. Profile and outcome of poisoned patients vary from place to place; children are particularly at risk due to their curious and exploratory activity. This study was done to know the profile and outcome of children admitted with acute poisoning.

In our study poisoning contributed for 5.667% of total Pediatric admission, this is comparable to the values reported by Kariyappa M et al in their study, study conducted by Shashidhar V et al have reported poisoning admission rate of 1.54% of total admission.[14,15] In the present study Male : Female ratio was 1.24 : 1, Male preponderance of admission is reported by study conducted by Shashidhar V et al and Budhathoki S et al, in contrast to this female preponderance of admission is reported by Kariyappa M et al.[14-16]

Majority of cases in the study were from rural area (n= 157, 62.06%), similar findings is reported by study conducted by Shashidhar V et al.[15]. Majority of cases (n= 116, 45.85%) in the study belonged to class IV SES as per Modified Kuppuswamy's classification, as our hospital is a government institute which caters mainly to patients from lower socioeconomic strata, hence had a higher distribution in class IV SES.

In our study it was observed that maximum number of acute poisoning were noted in age group below 5 years (n= 174, 68.77%), similar age distribution of admission is reported by study conducted by Kariyappa M et al.[14] and Budhathoki S et al.[16]. This age group is more susceptible to poisoning because of their curiosity, exploratory behaviour, hand to mouth activity and as they cannot differentiate between harmful and harmless substance. Majority of poisoning cases (n= 217, 85.77%) in our study is predominantly accidental in nature; similar pattern is reported in study done by Shashidhar V et al.[15]. Majority of poisoning (n= 216, 85.38%) in this study has happened in indoor environment, similar findings is reported in study done by Shashidhar V et al.[15]. The reasons for this are improper storage of poisonous products, look-alike packing and keeping poisonous substances in reach of child.

In our study maximum number of poisoning cases were due to kerosene (n= 89, 35.18%) followed by drugs (n= 38, 15.02%) and pesticides (n= 36, 14.23%). Similar findings is reported by study conducted by Kariyappa M et al, kerosene was the most common agent responsible for poisoning in study done by Shashidhar V et al, in contrast to the present study pesticides was the most commonly implicated agent for poisoning in study done by Budhathoki S et al.[14-16] The higher incidence of kerosene poisoning in our study is probably due to the fact that low income families still use kerosene as fuel for cooking purpose, its improper storage in water bottles or at place which is easily accessible to children.

In majority (n= 142, 56.13%) of cases the child was kept under observation and discharged within 24 hours. Overall survival rate noted in the present study is 98.81% (n=250). Only 3 cases of poisoning (1.19%) expired at our hospital during study period, this is similar to the values reported by Kariyappa M et al (2.1%), and much lower than that of 12.3% reported by Budhathoki S et al.[14,16]

Incidence of acute poisoning has remained same, majority of the cases are from <5 years age group and from rural area belonging to lower socio economic strata. Kerosene, drugs and pesticides were the most common agents implicated in poisoning; in majority the poisoning was accidental and happened in home environment.

CONCLUSION

Based on the above data following measures are suggested to reduce the incidence of poisoning and the resultant mortality in Pediatric population:

1. Educating the parents regarding the risks associated with poisoning thereby creating awareness in them
2. Storage of poisonous substance at a safe palace away from reach of children
3. Use of child proof packs
4. Proper disposal of poisonous substances
5. Avoiding storage of kerosene or other liquid poison compounds in water bottle or empty soft drink bottles
6. Basic health education during schooling.

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