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Research Article

PROFILE OF PAEDIATRIC POISONING AT A TERTIARY CARE CENTER IN KARNATAKA

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Abstract

Objectives: To determine the profile and outcome of paediatric patients presenting with poisoning to a tertiary care center in Karnataka.

Methods: Retrospectively we studied the PICU records of all the paediatric patients who presented with acute poisoning during the 4-years period from Feb 2010 to Jan 2014. All children aged less than 18 years with a definite history and suspected cases of poisoning were included.

Results: 106 patients presented with acute poisoning during the study period. The majority of our patients were in the 0 - 6 year age group. Poisoning in this age group was most common with higher frequency in males, the ratio being 1.2:1. The agents most frequently used were hydrocarbons (43.1%), pyrethrin compounds 15.5%, Organo-Chlorine compounds 12.1% drugs, Organo-Phosphorous compounds 12.1%, drugs 1.8%. In 1 - 6 year age group 54.7% cases were accidental in nature, whereas in the 12 - 18 year group 93.3% were suicidal. All patients were symptomatic and needed symptomatic or definitive treatment. 21 patients required mechanical ventilation. Almost 3/4th of patients underwent Gastric lavage. Specific antidote was given to 41 patients. 2 patients of OP poisoning died.

Conclusion: Our study concluded that accidental poisoning is common in 0-6 year children, the common substance being used in rural areas was kerosene and in urban areas it was found to be pyrethrin compounds. Lack of awareness of parents regarding appropriate storage of these dangerous household products is the main cause. Measures should be taken to educate the parents and public in order to decrease the poisoning cases. Suicidal cases are increasing in adolescents and precipitating factors like exam fear, exam failure, love failure and parental pressure regarding studies needs counseling of both parents and children.

Key words: Poisoning; Homicidal; Accidental; Suicidal

Introduction

Poisoning in children is a global problem and is an important paediatric emergency. More than 90% of toxic exposures in children occur at home and mostly involve a single substance (Reith *et al.*, 2001). More than 3 million poisonings occur in developing countries, according to WHO (Opawoye *et al.*, 1998) which is a preventable cause of morbidity and mortality. Profile of paediatric poisoning varies in different parts of the world and is influenced by the availability of poisonous substances, prevalent social, occupational, economic and cultural practices. Epidemiological surveillance is thus important for taking specific preventive measures.

In developed countries, studies have shown that common nontoxic household products are the major causes of paediatric poisonings and most of the paediatric patients are discharged after a brief period of observation in the emergency room (Bhat *et al.*, 2011; Marchi *et al.*, 1998; Rodgers *et al.*, 2010; Lamireau *et al.*, 2002). Decrease in cases of paediatric poisoning related to toxic drugs and

chemicals in these countries is due to introduction of child proof packs and bottles (Lawson *et al.*, 1974), measures which are yet to be implemented in many of the developing countries.

There are paucity of studies from India that describe the profile of paediatric poisoning from various regions (Kohli *et al.*, 2008; Sitaram *et al.*, 1985). With increasing urbanisation and rapid socioeconomic development in India during the last two decades, some change in paediatric poisoning profile and outcome is to be expected. We carried-out this study in the department of PICU of a tertiary care centre in Karnataka with the aim of determining the profile and outcome of children presenting with acute poisoning.

Material and methods

Retrospectively we studied the PICU records of all the paediatric patients who presented with acute poisoning during the 4-years period from Feb 2010 to Jan 2014.

Inclusion criteria: All children aged less than 18 years with a definite history and suspected cases of poisoning were included.

Exclusion criteria: Children with history of snake bites, scorpion stings and food poisoning were excluded from the study.

We noted and analysed the data regarding age, sex, type of residence, type and quantity of substance consumed, time of ingestion, nature of ingestion, time of symptom onset, time of presentation to hospital, symptoms and signs, investigations, diagnostic and therapeutic interventions, and outcome. Finally Fisher's exact test was used for statistical analysis, where p value less than 0.05 was taken as significant.

Results

During the 4-year study period from Feb 2010 to Jan 2014, 106 children (61 males, 45 females) were admitted with history of acute poisoning constituting 2.6% of PICU admissions. Median age of these children was 5 years with a range of 5 months to 18 years. The majority of children, i.e., 55 (51.8%) were in the 0 - 6 year age group, while 6 (5.6%) were in the age group of 6 - 12 year and 45 (42.4%) were in 12 - 18 year age group (Table 1). Male: female ratio was 1.3:1. 80 (75.4%) cases were from rural areas, whereas 26 (24.5%) cases were from urban and suburban areas.

Table 1: Distribution of 106 children according to age and type of poisoning

Mode of Poisoning	Age-wise distribution of children					
	0-6		6-12		12-18	
	Male	Female	M	F	M	F
Accidental	33	20	3	1	0	1
Homicidal	0	2	0	1	1	1
Suicidal	0	0	1	0	23	19
Total	55		6		45	

In majority of the cases, poisoning was accidental in nature accounting for 54.7% (58 cases) and suicidal cases were 40.5% (43 cases) and least was homicidal accounting for 4.7% (5 cases) (Table 2). Among 55 children aged 0 - 6 years, 96.3% had accidental poisoning and homicidal was (3.6%), and none with suicidal poisoning. Among the 6 children aged 6-12 years, 66.6% had accidental poisoning and suicidal and homicidal cases accounted for 16.6% each. In 12-18 years group majority of cases were suicidal (93.3%), homicidal 4.4% and accidental 2.2%. Accidental poisoning was maximum among 0-6 years age group and is statistically significant (p value <0.05) compared to the other age groups. Similarly suicidal poisoning was maximum among 12-18 years age group and is statistically significant (p value <0.05) compared to the other age groups. Among 43 children with suicidal poisoning, 40

children had precipitating factors like exam fear, exam failure, love failure and parental pressure regarding studies.

Table 2: Toxic substances used according to mode of poisoning

Poison	Accidental	Homicidal	Suicidal	Total	%
OP compounds	7	2	20	29	27.3
OC compounds	7	1	17	25	23.58
Pyrethrin compounds	9	0	0	9	8.41
Kerosene	21	0	0	21	19.81
Paint diluents	4	0	0	4	3.7
Ferrous fumarate	2	0	0	2	1.8
Campher	4	0	0	4	3.7
Poppy seeds	1	0	0	1	0.9
Phenobarbitone	0	0	4	4	3.7
Datura	2	0	0	2	1.8
Cyanide	0	1	0	1	
Rat poison	1	1	2	4	3.7

The history of definite poison was found in 92 cases (86.7%). Patient attenders did not give history of poisoning in 14 cases (13.2%). In our study, we found that insecticides accounted for 40.8%, hydrocarbons accounted for 23.6% and drugs accounted for 5.5%. Among the insecticides, organophosphorous compounds were the commonest agents.

Among 58 accidental poisoning cases, hydrocarbon poisoning accounted for 43.1%, the commonest substance being kerosene followed by paint diluents. Insecticides accounted for 21.1% and OP and OC compounds accounted for 12.1% each. The commonest OC compounds used was lindane. The common accidental poison in rural areas was found to be kerosene and pyrethrin compounds in urban cases. Out of 43 suicidal cases insecticides accounted for 86% and drugs 9.3%. Among 5 homicidal cases, insecticides were used in 3 cases, cyanide in 1 case and rat poison in 1 case.

All children presented with symptoms at time of admission. 59.4% of cases presented with vomiting, 35.8% presented with respiratory distress, altered sensorium and seizures were seen in 33% and 19.8% respectively. 16.3% presented with pneumonia, 29% had excessive salivation. Fever was found in 8.4% cases. Pain abdomen, diarrhea and GI bleeding were found in 3.7% each (Table 3).

Gastric lavage was done in 81 cases and sent for poison detection center and was confirmed in all cases. Gastric lavage was not done in 25 hydrocarbon cases. Specific antidote was required in 41 cases: 29 OP cases, 2 iron poisoning, 2 datura poisoning, 1 poppy seed poisoning and 1 rat poisoning, 1 paracetamol poisoning. All patients required symptomatic or definitive treatment. Mechanical

ventilation was required for 19.8% cases. Death occurred in 2 cases (1.8%) due to OP compound who presented late to the hospital i.e, after 24hrs of consumption.

Table 3: Common presenting symptomatology

Symptoms	No. of patients	Percentage
Vomiting	63	59.4
Respiratory distress	38	35.8
Altered sensorium	35	33.0
Seizures	21	19.8
Excessive salivation	29	27.3
Pneumonitis	17	16.3
Fever	9	8.4
Pain abdomen	4	3.7
Diarrhoea	4	3.7
GI bleeding	4	3.7
Oral burns	1	0.9
Acidotic breathing	2	1.8
Psychosis	2	1.8
Mechanical ventilation	21	19.8
Death	2	1.8

Discussion

Paediatric poisoning is an important cause of morbidity and mortality in our country, accounting for 0.33% to 7.6% of total admissions (Dutta *et al.*, 1998) (2.6% in our study). Various studies from India and abroad have shown that paediatric poisoning is more common among boys and a similar result was observed in our study (Kohli *et al.*, 2008). Children between 0-6 years were most commonly affected in our study is consistent with other studies (Rodgers *et al.*, 2010; Kohli *et al.*, 2008; Dutta *et al.*, 1998). The reason could be rapid neurological development, leading to increased exploratory activity.

As a form of child abuse, poison can be deliberately administered by care givers or others. In our study, it accounted for 4.7%. Previous studies from India showed that kerosene is the major culprit for childhood poisoning accounting for 25-50% of cases. In our study, kerosene poisoning accounted for 36.2%. The reason could be that, kerosene is the most commonly used cooking fuel by the rural population and is frequently stored in empty water bottles within the reach of children. However in a study done by Bhat *et al.* showed that insecticides were the leading cause of accidental poisoning, followed by drugs and kerosene (Bhat *et al.*, 2011).

In children < 6years, poisoning is accidental in nature compared to adolescents in whom it is more often suicidal (Rodgers *et al.*, 2010; Gupta *et al.*, 2003) and this was confirmed by our results which showed that 96.3% were accidental and 93.3% of suicidal in these age groups.

In our study, the order of accidental poisoning substances were hydrocarbon 43.1%, pyrethrin compounds 15.5%, OC compounds 12.1%, OP compounds 12.1% and drugs 5.7%. In developed countries, majority of poisonings are due to common non-toxic household substances.

40% do not develop symptoms and 60% symptomatic patients are discharged after a brief period of observation (Buffoni *et al.*, 1981; McGuigan *et al.*, 1999). In our study all (100%) our patients were symptomatic with different grades of severity ranging from mild to severe life threatening conditions. Common symptoms noted in the decreasing order of frequency were vomiting, respiratory distress, altered sensorium, seizures, excessive salivation, lacrimation, pneumonitis, fever, pain abdomen, diarrhea, GI bleeding, oral burns and psychosis. 21 patients were put on mechanical ventilation and 2 died.

In our study, the most common accidental poisoning substance is found to be pyrethrin compounds followed by OC compounds in urban areas. The reason could be excessive use of mosquito repellants made up pyrethrin compounds.

The suicidal poisoning among adolescents in our study is 93.3%. In a study done by Nowneet Kumar Bhat et al it was 80.9%. In our study, the reasons were exam fear, exam failure, love failure and parental pressure regarding studies. This worrisome result indicates the need for both parental and adolescent counseling. The common suicidal substance in our study is found to be insecticides followed by drugs. The suicidal cases were more among boys compared to girls.

In our study we found 2 rare poisonous substances like poppy seeds and cyanide. The cyanide is used for homicidal poisoning. The retrospective nature of the present study is a limitation of the study.

Conclusion

Our study concluded that accidental poisoning is common in 0-6 year children, the common substance being used in rural areas was kerosene and in urban areas it was found to be pyrethrin compounds followed by OC compounds. Lack of awareness of parents regarding appropriate storage of these dangerous household products is the main cause. Measures should be taken to educate the parents and public in order to decrease the poisoning cases. We also came to know that, suicidal cases are increasing in adolescents and precipitating factors like exam fear, exam failure, love failure and parental pressure regarding studies needs counseling of both parents and children.

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