International Journal of Science and Research (IJSR)
ISSN (Online): 2319-7064
Index Copernicus Value (2013): 6.14 | Impact Factor (2013): 4.438

Clinical Profile of Poisoning in Children Admitted in a Tertiary Care Centre

D. Manikyamba[1], N. Madhavi[2]

[1]Professor & HOD, Department of pediatrics, Rangaraya Medical College, Kakinada, India

[2]Associate Professor Department of pediatrics, Guntur Medical college, Guntur, India

Abstract: ***Background: Accidental poisoning is one of the important causes of childhood morbidity and mortality. The pattern of poisoning has been changing with new hazards constantly appearing due to introduction of new drugs and chemicals. Childhood poisoning is usually accidental making poisoning a preventable problem. As we lack concrete data about poisoning in children from our region, we decided to undertake this study to quantify the problem of childhood poisoning so that effective steps can be taken up to educate the parents and the caretakers to prevent this common problem in the vulnerable pediatric population. Materials & Methods: All poisoning cases admitted in Pediatric Emergency Department in a tertiary care centre over a period of two years were studied prospectively regarding prevalence of poisoning, common types of poisons encountered, most common age group involved, and seasonal variation in the occurrence of poisoning and the complications and outcome of children admitted with poisoning. Children with doubtful history of food poisoning and idiosyncratic reactions to drugs were excluded from the study. Results: Out of 6398 pediatric admissions to the emergency department during the study period, 183 (2.86%) were due to poisoning. The commonest poison consumed was kerosene (50%) followed by acids/alkalis (13%) and pesticide/insecticide (6.02%). Maximum number of poisonings was accidental in nature and mostly in the age group of 1-3yr (64%), males were more frequently affected than females with a ratio of 1.56:1, more cases occurred in rural areas and during summer season. Poisoning due to bites and stings was 44.26% of total cases with 58% due to snake bites and 24.7% due to scorpion stings. Most of the bites and stings were in males from rural areas in the age group of 10-12yr. 2 cases were admitted due to inhalation of diesel fumes & instilled almond oil in the nose. 5 cases expired due to ingested poison and 3 cases expired due to bites and stings.***

Keywords: Childhood Poisoning, Ingested poison, Kerosene, Snake bites, Scorpion stings

1. Introduction

Poisons are substances which produce ill health or death by their constitutional or local effects or both. Children being vulnerable section of our society, have been the principal victims of all social ills, poisoning being no exception. Accidental poisoning, a common pediatric emergency is one of the important causes of childhood morbidity and mortality especially in developing countries. Though there is no significant reduction in the number of accidental poisonings, the pattern of poisoning has shown a great change with new hazards constantly appearing due to introduction of new drugs and chemicals for domestic use, farming or industrial purpose[1]. Unlike adults, childhood poisoning is usually accidental making it preventable with some simple but intelligent interventions. Despite a fair assumption of the magnitude of the problem, we lack concrete data about poisoning in children from our region. Hence the present study was taken up to quantify the problem of childhood poisoning so that effective steps can be taken up to educate the parents and the caretakers to prevent this common problem in the vulnerable pediatric population.

2. Aims & Objectives

To know the prevalence of poisoning, commonest type of poison involved, common age group affected, precipitating factors for poisoning and the complications and outcome of children with poisoning.

3. Materials & Methods

The present study was a prospective observational study conducted over a period of 2 years (2010 October to 2012 September). Children with history of consumption of poison with or without clinical features, with doubtful history of poisoning but with signs and symptoms of acute poisoning, with history of bite or sting with or without clinical features of envenomation and with doubtful history of bite or sting but with definite features of envenomation were included in the study. Children with doubtful history of food poisoning and idiosyncratic reactions to drugs were excluded from the study. Duration between consumption of poison and onset of symptoms, manner of poisoning were noted in all children in the study. In case of bites and stings, details of type of bite, site of bite, time of bite were noted. Clinical features, vital data were taken, general & thorough systemic examination was done in all. Investigations like Chest X ray, ECG, complete blood picture, bleeding time, clotting time, coagulation profile, LFT, RFT & ABG were done whenever required. Supportive care and specific treatment were given depending on the type of poison. Data is tabulated & statistically analyzed.

4. Result

In the present study, out of total 6398 admissions to the Pediatric Emergency Department of Government General Hospital, Kakinada, a tertiary care centre, over a period of 2 years , 183 cases were due to poisoning which included ingested, inhaled poisons and poisoning due to snakes and insect bites. Out of total 183 poisoning cases, 100 cases were due to ingested poisons, 81 cases due to snake and insect bites and two were due to inhalation accounting for 54.4%, 44.6% and 1.1% of the cases respectively. The 2 cases of inhalation poisoning were due to inhalation of diesel fumes and inhalation of almond oil instilled in nose (Table-1).

Table 1: Pattern of Poisoning

Pattern of Poisoning	*No of cases*	*Percentage (%)*
Ingested poisons	100	54.64%
Bites & stings	81	44.26%
Inhalational poison	2	1%
Total	183	

Table 2: Demographic characteristics of poisoning

	Ingested poisons	*Stings & Bites*
Total cases	100	81
Age		
<1 yr	1	0
1-3 yr	37	10
4-9 yr	19	31
10-15 yr	4	40
Sex		
Male	61	54
Female	39	27
Season		
Summer	53	31
Rainy	20	32
Winter	27	18
Locality		
Rural	68	56
Urban	32	25
Mortality	4	3

Out of 100 cases admitted due to ingestion of poison, 54 cases were due to ingestion of hydrocarbon compounds with 50 cases of kerosene ingestion, 2 cases of diesel ingestion and 2 cases of turpentine oil ingestion. 13 cases were admitted due to ingestion of corrosives with 7 cases of acid ingestion and 6 cases of alkali ingestion. 12 cases were admitted due to ingestion of pesticides and insecticides, out of which 4 cases were due to rat poison ingestion and 2 cases due to organophosphorous poisoning and 1 case each due to gammaxene and pediculocide ingestion. 9 cases were due to ingestion of drugs. Of these, 3 were due to ingestion of paracetamol, 2 cases due to cyproheptadine syrup and 1 case each due to ingestion of zandu balm, telmisartan tablets and carbamazepine tablets. 9 cases were admitted due to ingestion of various plant products. One case was due to ingestion of neerium seeds, 6 cases were due to fruits of zatropa plant and 2 cases due to ingestion of dathura seeds. 1 case each was due to ingestion of ayurvedic herbal oil, phenyl hydroxyl amine and yellow phosphorous (Table-2).

In the present study, among all ingested poisoning cases, maximum numbers of patients were in the age group of 1-3 years (toddlers), 68% cases occurred in rural children while 32% were from urban areas. This difference is statistically significant with p value of 0.001. Maximum number of cases occurred in summer season (53%). Out of total 100 cases of ingested poisoning, 61 occurred in males and 39 cases in females. Male to female ratio was 1.56:1 with p value of 0.028 and degree of freedom is 1 which is statistically significant. It was also found that 21% cases of ingested poisoning belonged to lower middle, 22% cases from upper lower and 57% of cases from lower socio economic class and 94 cases were accidental while 6 cases were suicidal in nature. Out of 6 cases of suicidal poisoning, 3 cases were due to stress in school, 2 cases due to conflict with parents and 1 case due to parental disharmony. 5 cases of suicidal poisoning survived and one expired due to organophosphorous poisoning and out of total 100 ingested cases of poisoning, 96 cases survived while 4 cases expired, the causes being 1 case each of organophosphous poison, acid ingestion, paraquat ingestion and ayurvedic pain relieving oil.

Out of 50 cases of kerosene poisoning, 43 were symptomatic and 7 were asymptomatic. Common clinical features of kerosene poisoning included tachypnea (82%), fever (78%), irritability (68%) and vomiting (58%).

Out of 81 cases of various bites and stings, 47 cases were due to snake bite, 20 cases due to scorpion sting, 1 case due to centipede bite and the remaining 13 cases were due to unknown bites. Higher incidence of bites and stings was seen among males compared to females (ratio 2:1 with p value 0.003) and in children between 10-12 yrs (48 .12%) of age. Bites and stings were more from rural areas (69.1%) as compared to urban areas (30.9%) with p value of 0.001. Out of 81 cases of bites and stings, 78 cases survived while 3 cases expired, 2 cases due to snake bite and 1 case due to scorpion sting. Among snake bites, 68.1% were due to non-poisonous snakes and 31.9% were due to poisonous snakes.

Table 3: Incidence of various bites and stings

Type of bite/sting	No of cases	Percentage %
Snake bite	47	58%
Scorpion bite	20	24.7%
Centipede bite	1	1.2%
Unknown bites	13	16.1%
Total	81	

Out of 15 poisonous snake bites, 7 were viper bites, 3 were cobra bites and 5 were krait bites. Local edema (7) and cellulitis (7) were the commonest clinical features seen in viper bites. Ptosis (5), headlag (1), diplopia (4) and respiratory muscle weakness (3) were the common features in krait and cobra bites.

Average time interval between appearance of clinical features and scorpion sting was 1 to 6 hours. Common clinical features of scorpion sting were local pain (80%), cool peripheries (80%) and tachycardia (70%). Other features included sweating (60%), vomiting (50%), hypertension (40%) and paraesthesias (30%). Priapism was seen in 4 children, 1 child expired due to cardiogenic shock.

5. Discussion

In the studies conducted in District Hospital, Belgaum, JLN Medical College, Ajmer and King George Medical College, Lucknow[2,3,4], the prevalence of childhood poisoning was found to be 1.9%, 1.1% and 2.1% respectively. In our study, the prevalence of poisoning was observed to be 2.86% of total emergency pediatric admissions which is within the narrow range of the previous results. The commonest poison consumed in our study was kerosene (50%) and in the studies quoted above, it was 48%, 48.8% and 47% respectively and the studies conducted in Calicut, Tanjavur and Srinagar[5,6,7], also showed similar results. Even with the increasing usage of liquefied petroleum gas for cooking and availability of electricity in rural areas, we found in our study kerosene to be still the major cause of accidentally

ingested poison because kerosene is still being used as a cooking fuel especially by rural population and for lighting because of prolonged power cuts in villages. Storage of kerosene in bottles used for drinking water and in cool drink bottles and easy accessibility as kerosene bottles are kept on the floor or in open cupboards in majority of households without properly capping the bottles, are some of the reasons for common occurrence of accidental ingestion of kerosene. The commonest age group involved in our study was 1-3 yr (64%). In the studies conducted at Belgaum, Ajmer & Lucknow [2,3,4], the commonest age group affected was 1-3 yrs (47.36%), 0-5 yrs (81.2%) and 1-2 yrs (41.1%) respectively. Children between 1-3 yrs age are most vulnerable to accidents because of their inherent inquisitiveness, high oral exploratory activity and inability to differentiate between harmful and harmless things. The higher incidence in males is probably due to greater degree of activity. We found higher incidence of poisoning in summer season (53% cases) as compared to rainy (20%) and winter seasons (27%) because of increased thirst during summer months due to which toddlers may inadvertently drink poisonous substances especially kerosene that is stored in drinking bottles. Our study showed that 94% poisoning cases were accidental in nature and 6% cases were suicidal in nature. Our results are comparable with other studies which also showed high incidence during summer season due to accidental ingestion. In our study, 6 cases were due to suicidal poisoning, of which 3 cases were due to ingestion of rat poison and 1 case each due to ingestion of organophosphorous compound, neerium seeds and carbamazepine tablets. In the studies conducted by Krishna Kumar et al [8] and Deepak Pokhrel et al [9], pesticides especially rat poison and organophosphorous compounds were found to be the commonest mode of deliberate self harm. The increased incidence of rat poison ingestion is because it is commonly used in all households for killing rats and easily available in the market. The cause of suicidal poisoning was due to school stress in 3 cases, conflict with parents in 2 cases and parental disharmony in one case which correlates with the results of Krishna Kumar et al and the association between stress and deliberate self-harm in adolescents is well documented[10]. In the present day society, Indian children are subjected to enormous pressure regarding education. High parental expectations and parental behaviors are also contributing to school related stress [11]. The influence of visual media on the behavior of children needs in-depth evaluation as children can get the idea of self poisoning from the media [12]. In our study we found that almost all cases of ingested poison occurred in families from poor socio economic status probably due to lack of education, overcrowding, poor storage facilities and no proper supervision by the mother due to work load. Although no cases were reported from families of upper socio economic status in our study, it doesn`t mean that poisoning is completely absent in these families. Better living environment and greater awareness of hazards makes accidental poisoning less common in children belonging to upper socio-economic class.

In our study, 1 case of lipoid pneumonia was admitted due to aspiration of almond oil instilled in the nose by the mother which is a harmful traditional practice in certain Indian communities. So mothers should be educated regarding these harmful practices. The incidence of poisonous snake bites was slightly more in our study group (31.9%) as compared to other studies. Males constituted 66.7% of total snake and insect bite victims which was similar in other published studies. Increased incidence of bites & stings in male children is probably because of increased outdoor activity, playing in open fields and going to agricultural fields along with their fathers. The higher incidence of bites & stings in rural population (69.1%) is probably due to construction of houses near the agricultural fields, sleeping on the floor and outdoors and walking with bare feet. As the bitten snake was brought in very few cases, the type of snake bite was mainly determined based on clinical manifestations and description of the snake by the patient or bystanders. Out of 15 cases of poisonous snake bites, 7 cases were due to viper bites, 5 cases due to krait and 3 cases due to cobra. 2 cases died due to envenomation following viper bite. In majority of scorpion stings, symptoms appeared between 1-6 hr following the sting and the common clinical features were local pain, cool peripheries and tachycardia. 14 cases were brought with history of scorpion sting while 6 cases were brought with history of unknown bite but at admission they were having symptoms & signs suggestive of scorpion sting and improved with prazosin therapy. 8 cases of scorpion sting had myocardial dysfunction requiring dopamine support and 1 case expired due to cardiogenic shock.

6. Conclusions

Poisoning is a common pediatric emergency and a thorough knowledge about the nature and magnitude of the problem especially with regional peculiarities is necessary. The advent of various social and environmental changes brought about a noticeable alteration in the pattern of poisoning and fresh hazards are constantly appearing with the introduction of newer chemicals due to domestic, agricultural and industrial usage. Pediatric case reports from various centers are useful to reveal the much needed information about this changing spectrum of childhood poisoning. In developing counties, a combination of factors are contributing to accidental poisoning among children from low socio economic families. The data from the present study does not enable the assessment of risk factors for poisoning. However, identifying the relative importance of different poisons as a cause of childhood morbidity may help in channeling the intervention programs to help in further research on this issue in the right direction. Some measures to prevent poisoning are to educate the people to keep household chemicals out of reach to children, to keep them in a locked cupboard or in a high cupboard, to keep chemicals & medicines in their own containers, not to keep them in cool drink bottles or vessels used for storing food, to keep caps on bottles and keep them properly closed, not to keep chemicals and medicines next to food or drinks, not to keep chemicals or empty containers that are no longer needed, to keep the floors and walls clean, to fill up all the holes and cracks so that there is no scope for insects and snakes to get into the house. Some tips to avoid snake bites especially in the rural areas include not to walk outdoors with bare feet, to wear long leather shoes while walking in tall grass, to use torch while walking around at night, not to touch even if snake looks dead, not to turn over stones or logs or put hands or feet into a hole in the ground and not to

sleep on the ground. Government by educating the public through mass media such as television, radio and newspaper should create awareness about the potential hazards of common household poisons to prevent this problem in the vulnerable pediatric population.

References

[1] Singh S, Singhi S, Sood NK, Kumar L, Walia BNS. Changing pattern of childhood poisoning (1970-1989): Experience of a large North Indian hospital. Indian Paediatr. 1995;32:331-5.
[2] H. Ravindra S et al. A study of pediatric poisioning cases, Indian Journals com. 2010; 10(1);47-50.
[3] Khadgawat R, Garg P, Bansal P, Arya A, Choudhary B. Accidental poisoning. Indian Paediatrics. 1994;31:1555-7.
[4] Gupta S, Govil YC, Misra PK, Nath R, Srivastava KL. Trends in poisoning in children: experience at a large referral teaching hospital. Natl Med J India. 1998;11(4):166-8.
[5] Job C. A regional study of poisoning in children. Journal of the Indian Society of Toxicology. 2005;1:10-3.
[6] Ahmad KW, Ahmad M, Rashid KR, Sethi AS, Shabhnum. Poisoning in children. JK Practitioner. 2004;11(4):274-5.
[7] Ganga N, Rajarajeswari G. Poisoning in children. Indian Paediatrics. 2001;38:208.
[8] Krishna Kumar P, Geeta MG, Gopalan AV. Deliberate self poisoning in children. Indian Paediatrics. 2005;42:582-86.
[9] Deepak Pokharel, Yogesh Shah, et. al. (2013) An Outbreak of Vibrio ... Epidemiological Study of Medicolegal Organophosphorus Poisoning in Central Region of Nepal.
[10] Hawton K, Rodham K, Evans E, Weatherall R. Deliberate self harm in adolescents: self report survey in schools in England. BMJ.2002;325:1207-11.
[11] Wai BHK, Hong C. Suicidal behavior among young people in Singapore: General hospital. Psychiatry. 1999;21:218-19.
[12] Hawton K, Simkin S, Deeks JJ, Connor SO, Keen, et al. Effects of a drug overdose in a television drama on presentations to hospital for self poisoning: time series and questainnaire study. BMJ. 1999; 318:972-77.