ORIGINAL ARTICLE

Acute Poisoning in Children: Etiological Agents, Risk Factors and Outcomes

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ABSTRACT

A total of 70 patients were thus included. The patients were followed till discharge. A Proforma was filled and results were analyzed on SPSS version 10 of computer programme. All consecutive patients of poisoning who visited the Emergency Ward during the study period fulfilling inclusion criteria were enrolled. The mean age was 2.89 years with range of 6 months to 10 years. Male to female ratio was 1.5:1. Kerosene was the commonest agent accounting for 50% of all cases, followed by pharmaceutical products (14.3%) and chemicals (12.9%). Storage of Kerosene in empty bottles of beverages and lack of proper storage of drugs were the commonest risk factors identified. Oral ingestion was the most common route of intoxication. Most of the patients (84.3%) were discharged without any sequelae. Overall mortality was 5.7%. Conclusion most of toxic substances to which children were exposed were those stored in eatable containers i.e. kerosene oil. Minority of children with accidental poisoning developed serious toxicity. Parents can prevent many of these accidents by identifying, adequately storing and locking away toxic material.

Keywords: Poisoning, kerosene, pharmaceutical preparations, child

INTRODUCTION

A poisoning can be defined as the exposure of victim to an agent that, by transference of chemical or radiant energy, can cause symptoms and signs of organ dysfunction leading to injury or death[1]. Poisoning in children is largely an accidental phenomenon & is common all over the world. It is an important health problem, which has significant costs, both financial & emotional. It is also a prime target for prevention and cost saving measures[2].

Though there is a lot of data about accidental childhood poisoning from developed countries, the subject has not been given due attention in the developing countries[3]. The exact scale of the problem is difficult to ascertain as few, if any, countries have a mechanism for collecting information on all cases and data from different countries is not comparable. However in developed countries there appears to have been a downward trend in the number of admissions due to accidental poisoning[4]. Poisons centers in the USA received[5].4 million calls concerning potentially toxic exposures in children over a period of 5 years; 61% of these were in children 1-2 years of age5. Boys are more likely to experience incidents of accidental poisoning than girls[6].

Accidental poisoning in children is a common cause of emergency department attendance. The National Poisons Information Service (London) took 187,000 telephone enquires during 1999, of these 32% were concerning accidental ingestions in children under 14 years of age[7,8,9]. In the USA it accounts for approximately 1.3 million consultations to Poison Centres10. In the USA, of 1,070,497 exposures reported in children under 6 years of age, only 1.1% had moderate or major clinical features of toxicity10. It is implicated in about 2% of all injury deaths in children in developed countries and about 5% in developing countries[11].

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MATERIAL & METHODS

A total of 70 patients were included in the study. from 1st July 2004 to 31st Dec 2004 and 18th July to 14th October 2006. Cases were taken from patients admitted in the Emergency Ward of the Children's Hospital/ Institute of Child Health & Ghurki Teaching Hospital/LMDC Lahore. All consecutive patients of poisoning who visited Emergency Ward during study period fulfilling inclusion criteria were enrolled.

Inclusion criteria: Patients with definite history of poisoning admitted in emergency with suspicion of accidental poisoning.

Exclusion criteria: Children <1 month of age with diseases like chronic encephlopathies, neuropathies and developmentally delayed.

RESULTS

A total of 70 children were admitted with accidental poisoning during the study period. Majority, 56(80%) of these were between 1 to 5 years of age, 3(4.3%)

less than 1 year while 11(15.7%) were of more than 5 years of age. Males were 60% and females 40% with male to female ratio 1.5:1. As regard the etiological agents involved, kerosene was taken by 35(50%), pharmaceutical products by 10(14.3%) and chemicals by 9(12.9%) children. Poisoning due to household products was found in 5(7.1%) children, 5(7.1%) presented with poisoning due to insecticides/pesticides and in 6(8.6%) cases the type of agent involved remained undetermined. Regarding the outcome of these 70 children, 67 were discharged and only 3 expired and this difference was statistically significant (P<0.05). Out of these discharged children, 59(84.3%) were discharged without any sequelae; 27(38.6%) from ER within 24 hours of admission. 4(5.7%) patients were discharged with some sequelae or residual damage. These included patients who developed esophageal stricture secondary to ingestion of caustic soda, bleach or alkali. It was the only sequelae observed in this study due to corrosive intake and this difference was statistically significant (P<0.05). 3(4.3%) patients were expired and 4(5.7%) left against medical advice. (Table 1 and 2)

Table 1: Demographic distribution with poisoning (n=70).

Variables	=n	%age
Age (Years)		
Upto 1	56	80
1 – 5	03	04
> 5	11	16
Sex		
Male	42	60
Female	28	40

Table 2: Qualitative variables of children with poisoning

Regions	=n	%age
Outcome		
Discharged without any sequale	59	84.3
Discharged with sequale	04	5.7
Expired	03	4.3
LAMA	04	5.7
Risk factors identified		
Stored in container meant for beverages	35	50
Medicine not locked	03	4.3
Uneducated parents	02	2.9
Over crowding	02	2.9
Chronic drug users	02	2.9
Undetermined	26	37.1
Aetiological agents		
Kerosene oil	35	50
Pharmaceutical agents	10	14.3
Chemicals	09	12.9
Household products	05	7.1
Insecticides	05	7.1
Unknown	06	8.6

DISCUSSION

Many studies have shown that children under five years of age are particularly at risk from accidental poisoning[14]. Our study is in keeping with this finding. Mean age of presentation is 2.89 years in this study is comparable to the mean age of 2.73 years in an Indian study[15]. Children in this age group have a habit of putting everything in their mouth, predisposing them to accidental poisoning. Male preponderance (60%), with male to female ratio of 1.5:1 was evident and is in agreement with previous local studies[16]. A similar male preponderance has been noted by many other studies[17]. In our study 87.1% patients were from urban background while a figure of 72.3% has been reported from a referral center in India[18]. Children in urban areas are exposed more to the poisonous agents like household products & drugs, as these are more frequently used in urban as compared to rural areas because of differences in lifestyle. Moreover catchments area to the hospital is mainly of urban citizens with easy access to the people of the city. Most referral is inhabitant of the city though we get referral from rural area too. Kerosene oil was the commonest agent involved in our study. It has been reported as the commonest substance involved in accidental childhood poisoning not only from other cities of Pakistan3 but also from other developing countries in Asia (India, Malaysia) & Africa (Nigeria)[19]. Kerosene oil is used as a fuel for cooking and other purposes in most of the developing countries and within easy reach of an exploring youngster. It is sold openly and families buy and store it in their own containers. Soft drink bottles are often used for its storage and these are kept in the kitchen. Children often mistake it for soft drinks and thus the ingestion. Pharmaceuticals products were the 2nd most common cause of poisoning in our study with psychotropic agents and sedatives being more common. It was mainly because of lack of awareness of adult family members regarding safe storage of medicines. Some of these look very much like sweets (smarties, bunties) which kids love to eat. The same results have been observed in a study from Karachi3. The etiological agents involved remained undetermined in 8.6% of cases in our study; other studies have reported undetermined agents from 9.6% to 20%[20]. Ingestion was the most common route (99% of cases). Similar results (96.8%) have also been reported in a study from India. 85.7% of exposures in our study occurred at home. It is in comparison (89%) with a study in Iran[20]. The most common risk factor identified in our study was that exposed agent was stored in empty discarded bottles of beverages (50% of cases) followed by lack of appropriate storage of

drugs. Similar results have been reported in studies from Malaysia and Thailand19. It was found in studies from Greece & Iran that children without adult supervision & those with previous poisoning were at increased risk of poisoning13. Most of the children 59(84.3%) in our study were discharged without any sequale, that is comparable to figure of 92% in another local study.16 Many of these were from urban background that reached the hospital earlier and had either no, mild or moderate symptoms of toxicity. Those who left against medical advice were mainly from rural area, uneducated with false believes and poor socioeconomic status.

CONCLUSION

Accidental childhood poisoning is a significant public health problem, causing morbidity and mortality especially when such accidents are preventable. Kerosene, pharmaceutical products and household chemicals are the main substances responsible for accidental poisoning as these substances are neither sold in proper containers nor stored properly. Majority of children with accidental poisoning were discharged without sequelae. Education of parents, adequate storage of potentially hazardous substances and adequate parental supervision could be the most important activities for prevention of childhood poisoning.

REFERENCES

1. Woolf AD. Poisoning in children & adolescents. Paediatr in Rev 1993; 14: 411-22.
2. Tempowski J. Epidemiology of poisoning children. In: Bates N, Edwards N, Roper J, Volans G (eds). Paediatric Toxicology Handbook of Poisoning in children. Park Avenue South, Stockton press, 1997: 1-8.
3. Khandwala HE, Kara AY, Hanafi IA, Yousuf K, Nizami SQ. Accidental poisoning in children in Karachi, Pakistan. Pak Pediatr J 1997; 21: 159 – 62.
4. Ferguson JA. Some epidemiological observations on medicinal and non medicinal poisoning in pre-school children. J Epidemiol Commun Helth 1992; 46: 207-10.
5. McGuigan MA. Common culprits in childhood poisoning: epidemiology, treatment and parental advice for prevention. Paediatr Drugs 1999; 1: 313-24.
6. Campbell TA, Collins KA. Pediatric toxicologic deaths: a 10 year retrospective study. Am J Forensic Med Pathol 2001; 22: 184-7.
7. Azizi BH, Zulkifli HI, Kasim MS. Risk factors for accidental poisoning in urban Malaysian children. Ann Trop Paediatr 1993; 13: 183 – 8.
8. Maqbool A, Maqbool H, Maqbool S. Poisoning in children. Sheikh Zayed Postgrad Med Inst 1995; 9: 52-7.
9. Jones AL, Dargan PI. What's new in toxicology? Current Paediatrics 2001; 11: 409-13.
10. Litovitz TL, Felberg L, White S, Klien - Schwartz W. 1995 Annual Report of the American Association of Poison Control Centers Toxic Exposure Surveillance System. Am J Emerg Med 1996; 14: 487 – 537.
11. WHO. World health statistics Annual 1992. World Health Organization, Geneva 1993.
12. Lifshitz M, Gavrilov V. Acute poisoning in children. Isr Med Assoc J 2000; 2: 504 – 6.
13. Petridou E, Kouri N, Polychronopoulou A, Siafas K, Stoikidou M, Trichopoulos D. Risk factors for childhood poisoning: a case control study in Greece. Inj Prev 1996; 2: 208 – 11.
14. Dawson KP, Harron D, Mcgrath L, Amirlak I, Yassin A. Accidental poisoning of children in the United Arab Emirates 1997; 3: 38-42.
15. Bhattacharyya S, Lahiri M, Chattopadhyay T. Seasonal pattern of pediatric poisoning in an agricultural belt of West Bengal. Indian Pediatr 2002; 39: 102-4.
16. Aslam M, Boluch GR, Hussain W, Malik A, Haider A. Accidental poisoning in children. Pak Pediatr J 2000; 26: 67-70.
17. Yang CC, Wu JF, Ong HC, Kuo YP, Deng JF, GerJ. Children poisoning in Taiwan. Indian J Pediatr 1997; 64: 469-83.
18. Singh S, Singhi S, Sood NK, Kumar L, Walia BN. Changing pattern of childhood poisoning (1970-1989): experience of a large north Indian hospital. Indian Pediatr 1995; 32: 331-6.
19. Gupta P, Singh RP, Murali MV, Bhargava SK, Sharma P. Kerosene poisoning – a childhood menance. Indian Pediatr 1992; 29: 979-84.
20. Izuora GI, Adeoye A. A seven - year review of accidental poisoning in children. Ann Saudi Med 2001; 21: 13-5.