

## ACCIDENTAL POISONING IN CHILDREN: FREQUENCY AND OUTCOME OF THE CASES AT A MILITARY HOSPITAL

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### ABSTRACT

**Objective:** To determine the frequency of accidental poisoning by various agents and their associated outcome in children.

**Study Design:** Descriptive Study.

**Place and Duration of Study:** The study was carried out in emergency department at PNS Shifa hospital Karachi, from January 2007 to December 2008.

**Material and Methods:** A total of 200 patients reported with accidental poisoning during the study period. Detailed history and examination regarding the nature of poisoning was taken. Relevant investigations for purpose of diagnosis were carried out. Mortality and morbidity was noted on predesigned proforma.

**Results:** Total 200 patients were admitted with accidental poisoning during the study period. 155(77.5%) of patients belonged to less than 5 year age group. Most frequently ingested poison was kerosene oil (51%), followed by insecticides (17.5%), Oral route was involved in majority of cases 194(97%). Complications were observed in 6% of cases, Pneumonia was the most frequently occurring complication in 8 (4%) cases of kerosene oil ingestion, followed by seizures in 2 (1%) cases of insecticide ingestion. No mortality was reported in this study.

**Conclusion:** Acute childhood poisoning is a significant public health problem affecting mainly toddlers. Main substances responsible for acute poisoning are Kerosene oil, insecticides, bleach and drugs.

**Keywords:** Insecticides, kerosene, Poisoning.

### INTRODUCTION

Poisoning in children is an important health problem, which has significant cost both financial and emotional as it is largely an accidental phenomenon.<sup>1</sup> Children below 5 years of age are affected, mainly due to their innovative and exploratory nature and mouth tendencies.<sup>2,3</sup> Peak incidence is around 2 years of age and males are affected more than females.<sup>4</sup>

Factors such as age of child, size of the family, living conditions, environments and exposure to various poisons which may vary in rural and urban setting, also determine the magnitude of the problem.<sup>5</sup> There are a number of hospital based epidemiological studies on childhood poisoning implicating different agents and all emphasize the implementation and improvement of prevention programs,

which can be aided to a large extent by the identification of high risk circumstances, susceptible age groups, chemical substances and commercial products involved in pediatric poisoning cases.<sup>6,7</sup> Most of these accidents usually occur due to negligence on the part of parents or guardian, to prevent the exposure of child from harmful substances.<sup>8</sup>

Recent trends show an increase in pharmaceutical and pesticide poisoning.<sup>6</sup> Kerosene oil poisoning is the commonest accidental poisoning seen in pediatric practice in most of the tropical countries.<sup>8-10</sup> Plants and insecticides have been common in the agricultural belts. The use of various insect repellents, aerosols and mats account for high incidence of poisoning due to household pesticide.<sup>11,12,13</sup> There are reports of poisoning due to cleaning agents.<sup>12,14,15</sup> Drugs are frequently ingested next to household products with variation in classes commonly consumed.<sup>12,14-16</sup> This study was carried out to determine the frequency of accidental poisoning in children and to determine the

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outcome associated with commonly involved agents in accidental poisoning in children.

## MATERIAL AND METHODS

This study was started in January 2007 and all children presenting in emergency with accidental poisoning till December, 2007 were included. The study included a total of two hundred cases. In our set up we receive all children, with history of poisoning in emergency department where they are provided emergency management, and then sent to pediatric ward for admission depending upon seriousness of the case. Most patients belonged to low and middle socio economic class. Detailed history was taken about the route of poisoning, name of the substance or drug on the basis of parent's knowledge about the name of drug or substance. Bottle, wrapper, packing material and stomach samples were taken for the identification of poisoning. Cases were categorized according to the agent involved in the poisoning. Complications were recorded to represent the morbidity and mortality. All data was collected and recorded on predesigned proforma. Cases of chronic poisoning, cases referred from peripheral hospitals for management of sequelae of accidental poisoning, cases of deliberate poisoning and mentally retarded children were excluded from study.

In our study children below 12 years age, both male and female, admitted to pediatric emergency department during study period were included in this descriptive study.

Data analysis was performed through SPSS( statistical programme for social sciences) version 11.0 descriptive statistics were used to describe the data that is and mean and standard deviation (SD) for quantitative variables where as frequency and percentages for qualitative variables.

## RESULTS

During the study period total 200 children were included. Age distribution of acute poisoning cases ranged from 6 months to 12 years (Figure). Mean age was 3.34 years (SD

=1.52). Males 136(68%) outnumbered females 64(32%).

Most frequently ingested poison was Kerosene oil 102(51%). This was followed by insecticides 35(17.5%), medications 32(16%), bleach 20(10%) and other house hold items 10(5%) as given in Table-I.

Regarding storage of poisonous agents 40(20%) were in original containers, while 160(80%) was in non original containers, as in majority cases kerosene oil and bleach were stored in soft drink bottles (Table-2).

Oral route remained most common, involving 97.5% of the cases. Seasonal variation was also found in our study with majority of cases (52.5%) occurring during summer. In

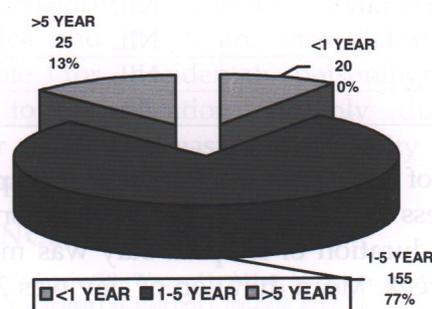


Figure: Age Distribution Of Children With Accidental Poisoning

Table-1: Substances responsible for accidental poisoning in children (n=200)

Group	Frequency	Percentage
<b>Medications</b>	<b>32</b>	<b>16%</b>
Tranquilizers	12	6%
Carbamazepine	5	2.5%
Ibuprofen	4	2%
Iron Tablets	5	2.5%
Multivitamins	3	1.5%
Undefined Tabs	3	1.5%
<b>House Hold Poisons</b>	<b>158</b>	<b>79%</b>
Kerosene	102	51%
Insecticides	35	17.5%
Bleach	20	10%
Opium	1	0.5%
<b>Others</b>	<b>10</b>	<b>5%</b>
Chooran	2	1.0%
Lime (Choona)	2	1%
Mercury	4	2.0%
Thermometer		
Naswar	2	1%

Table-2: Storage of Poisons (N=200)

Storage	Frequency	Percentage
Soft Drink Bottles	115	57.5%
Food Containers	16	8.0%
Juice Bottles	15	7.5%
Plastic Bags	13	6.5%
	<b>159</b>	<b>79.5%</b>
Original Containers	41	20.5%

Table-3: Complications associated with accidental poisoning (n=200)

Complications	Frequency	Percentage
Pneumonia	8	4%
Seizures	2	1%
Arrhythmias	1	0.5%
Coma	1	0.5%
Respiratory failure	NIL	0%
Intestinal perforation	NIL	0%
Renal failure	NIL	0%
Hepatic failure	NIL	0%
Death	NIL	0%
	12	6.0

most of the cases the duration of hospital stay was less than 24 hours 106(53%) and only 2% of cases duration of hospital stay was more than one week. Mean duration of stay was 2.25 days with standard deviation of 2.22 days. Complications are observed in 6% (12 cases) and most common was pneumonia, observed in 4%. No mortality was observed in this study. (Table-3)

## DISCUSSION

Accidental poisoning in children is a major problem for health authorities world wide and is responsible for serious morbidity with mortality risks.<sup>17,18</sup> The common agents responsible for this problem are different for different parts of the world.

The data in this descriptive study gives the experience of accidental childhood poisoning cases presented at emergency department of P.N.S Shifa hospital Karachi.

The frequency of childhood poisoning varies considerably not only between different communities, but also with seasonal variation in the same community. Surprisingly the ingested products are similar to those found in other developing countries.<sup>19</sup>

Kerosene oil is the most important household product commonly involved in accidental paediatric ingestions. It is used as a fuel for cooking and other purposes in most of developing countries including Pakistan and India. It is sold openly and people buy and store it in their own houses, usually in empty drink bottles. Our study indicates that most common cause of poisoning amongst children has been accidental ingestion of kerosene oil (51%) as reported by studies conducted in neighboring developing countries like Bangladesh<sup>20</sup> India<sup>21</sup> and Srilanka.<sup>22</sup> Whereas it seems that in the USA, the common cause of accidental poisoning in children are cosmetics and personal care products (perfumes, shampoo etc) and household cleaning substances and Kerosene is less frequent cause of accidental ingestions.<sup>23</sup>

Kerosene remains the most commonly ingested substance as reported in different studies from Pakistan; studies done at Quetta,<sup>24</sup> Peshawar<sup>25</sup> and NICH Karachi<sup>26</sup> have shown similar results. In a study done at the emergency department of civil hospital Karachi<sup>29</sup>, in 1980 and at NICH Karachi in 1990<sup>26</sup>, Kerosene oil was the most commonly ingested poison. Frequency of kerosene oil poisoning is almost the same today as it was couple of decades ago. This indicates that this aspect of health has not been given attention to by health care providers.

In our study Insecticide poisoning was responsible for 35 (17.5%) cases followed by drugs in 32 cases (16%), whereas Shakya et al<sup>27</sup> reported insecticide poisoning in 14.55% cases.

We documented opium poisoning in 1 (0.5%) case, which is consistent with other reports from Karachi. This low incidence is in sharp contrast to those reported from Baluchistan and N.W.F.P. One study reported 28 cases of opium poisoning (33.7%) in Civil Hospital Quetta<sup>24</sup> which corresponds well to figure of 27.59% reported from Government Lady reading hospital, Peshawar.<sup>25</sup> This difference within the country is probably attributable to local customs in these societies where opium is frequently available and used

to sedate the crying child or to suppress cough during chest infection.

In our study drugs were responsible for 32 (16%) cases as reported by other studies in Pakistan<sup>1</sup> and India.<sup>28</sup> Among the drugs; tranquilizers were responsible for 12(6%) cases and Iron tablets for 5(2.5%) cases. An increased incidence of iron ingestion was in contrast to other studies in Pakistan,<sup>1,29</sup> mainly due to introduction of chocolate flavored chewable iron tablets in the market and their improper storage by parents and grand parents. We found that parents and grand parents were the main users of the drugs, as shown by the other studies that risk of accidental ingestion increases in families where one of the family member is consuming medicines.<sup>30,31</sup>

Most cases occurred in children under 5 years of age (87.5%), mainly in the age group of 1-4 years, which is secondary to increased tendency of children of this age group to eat or drink any object or substance without the ability to discriminate between right or wrong. Only 25 cases (12.5%) were above 5 years of age. Children in this age group have better understanding of dangers associated with drugs and chemicals and also they spend more time outside the home.

Like other studies<sup>27</sup> we had an overall male preponderance (68%). This could be due to the more exploratory behavior in male children than in females,<sup>29</sup> and identifies the need to consider them as an important group. Oral route remains the most common involved in 97% accidental ingestion in our study. This is similar to other studies in Pakistan<sup>1,29</sup> and India.<sup>28</sup>

Poor storage measures directly contribute to poisoning incidents. It was documented in (80%) children. In majority of cases Kerosene oil and bleach were stored in soft drink bottles (57.5%). Similar findings were reported by Samina Shamim<sup>26</sup> and Khandwala.<sup>29</sup> Aziz BH reported in his study that Kerosene oil was ingested from soft drink containers in 70% of instances,<sup>32</sup> which is quite similar to our results.

Complications were observed in 12 (6%) cases and pneumonia was the most common complication observed. Among the cases of

kerosene oil ingestion 8 (4%) cases developed pneumonia which is a significantly higher percentage as compared to other studies in Pakistan.<sup>26</sup> This was also reported by Gupta in 1992 where mortality rate was 4.3% after kerosene oil ingestion.<sup>33</sup> The duration of hospital stay in majority of cases was less the 24 hours (53%) . Only 4 cases (2%) were admitted in hospital for more then 1 week. No mortality was found in our study as in majority of cases these ingestions were very small in quantity and the patients brought immediately to the nearest medical facility.

## CONCLUSION

Accidental paediatric poisoning represents a relatively frequent problem in Pakistan affecting majority of children. Kerosene oil, insecticides and drugs are main substances responsible for accidental poisoning and leading to complications, mainly due to improper storage, easy accessibility and suboptimal supervision.

## REFERENCE

1. Aslam M, Balouch GR, Waqar H, Akbar M, Aniq H, Accidental poisoning in children Pakistan ped J. Jun2002; 26:67-70.
2. Goto K, Endoh Y, Kuroki Y, Yoshioka T. Poisoning in children in Japan. Indian Pediatr 1997;64:46-8.
3. Mc-Caig LF, Burt CW. Poisoning related visits to emergency departments in United States. 1993-1996. J Toxicol Clin Toxicol 1999;37:817-26.
4. Gupta SK, Shah PS, Srivastava A, Thomas K. A study of childhood poisoning at National Poisons information centre, all India Institute of Medical Sciences, New Delhi. J Occup Health 2003;45:191-6.
5. Certain poisons and toxins. In: Gupta S, Editor text book of pediatric 8<sup>th</sup> ed. New Dehli: Jaypee brothers, 2000: 418-9.
6. Aggarwal NK, Bhatia MS, Aggarwal BBL. Deaths due to poisoning in children. Indian Pediatr 1999;36:415-6.
7. 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 Ind 1998; 11:166-8.
8. Farooni F, Portano C, Bini V, Lizzi R. the prevalence of accidental poisoning in a hospital paediatric unit of Latium. Ann Ig.2006 May-Jun; 18:207-13.
9. Choudhary SR, Singh A: Accidental poisoning in children. Indian pediatr 1996;33:39-41.
10. Reddy YR, Rao VS. Accidental poisoning and accidents. In: musdani PM. Editor. Textbook of paediatrics with special reference and problems of child health in developing countries. Vol New Delhi: Jaypee brothers, 1999; 2657-69.
11. Mullins ME, Brands CL, Daya MR. Unintentional pediatric super warfarin exposures: do we need a prothromoin time? Paediatrics 2000;105:402-4.
12. Leveridg YR. The pattern of poisoning in Costa Rica during 1997. Vet Hum Toxicol 1999; 41:100-02.

13. Summer D, Langelly R. Pediatric pesticide poisoning in the Carolinas; an evaluation of the trends and proposal to reduce the incidence. *Vet Hum Toxicol* 1999; 41:101-3.
14. Lifshitz M, Gavrilov V. Acute poisoning in children. *Isr Med Assoc J* 2000; 2:504-6.
15. Mc Guigan MA. Common culprits in childhood poisoning: epidemiology, treatment and parental advice for prevention. *Pediatr Drugs* 1999; 1:313-24
16. Kotwica M, Jarosz A, Kolacinski, Rogakzewska. Sources of poisoning exposures in children during 1990-1995. An analysis of NPIC files. *Int J Occup Med Environ Health* 1999; 10:177: 86.
17. Woolf AD. Poisoning in children and adolescents. *Pediatr Rev* 1993;14:411-22.
18. Ailal F, Dehbi F, Saloui B. Acute drug poisoning in children in a general paediatric services. *Rev Med Suisse Romande*. 1998;118:543-6.
19. Singh A, Choudhary SR. Accidental Poisoning Children Indian J. *Pediatr* 1996 Jan; 33(1):39-41
20. Azhar M.A Poisoning cases in district hospital of Bangladesh JOPSOM 1992; 11:69-72.
21. Khadgawat R, Bansal P, Arya A. Accidental Poisoning. *Indian Pediatr* 1994; 31: 1555-1557.
22. Ravindra F, Dulitha NF. Childhood poisoning in Srilanka. *Indian J Pediatr* 1997; 64:457-460
23. Litovitz TL, Klein- Schwartz W, White S. 2000 annual report of American Association of Poison Control Centres. Toxic Exposure Surveillance System. *AM J Emerg med*. 2001; 19: 337-395.
24. Kasi AM, Pervez Y, Bahadri T, Dotana A.R, Iqbal A. Opiium Intake and its implications amongst Infants and Children *Pak Ped J* 1988;12(1):31-38.
25. Wazir MD, Farmanullah. Poisoning in Children (Chemicals and Drugs). *Pak P ed J* 1982;6(4):299-203.
26. Samina S, Arif M.A. Kerosene oil poisoning in children. *Pak Ped J* 1992; 16(1):41-46.
27. Shakya K.N, Billoo A.G. Pattern of accidental poisoning in children *JPMA*. 1982Sep; 32(9):212-215.
28. Gupta SK, Peshin SS, Srivastava A, Kaleekal T. A study of childhood poisoning at national poisoning information center, All India Institute of Medical sciences. New Delhi. *J Occup Health*. 2003 May; 45: 191-6.
29. Khandawala H E, Kara A Y, Hanafi IA, Yousaf K, Nizami SQ. Accidental poisoning in children in Karachi. *Pakistan Ped J* . 1997 Dec;21:159-62.
30. Petridou E, Kouri N, Polychromopoulou A, Sifask, Stoikidou M, Trichopoulos D. Risk factors for childhood poisoning: a case-control study in Greece. *In j Prev* 1996;Sep;2(3):208-11.
31. Gibbon BN, Mallhey DE. *Pediatr*: Case of accidental overdose of methotrexate. *Ann Emerg med*. 1999 July;34 (1): 98-100.
32. Aziz B.H., Zulkifli H.I, Kassin M.S. Circumstances surrounding accidental poisoning in Children. *Med J Malaysia* 1994 Jan; 49(2):132-7.
33. Gupta P, Singh RP, Murali MV, Bhargava SK, Sharma P. Kerosene oil poisoning—a childhood menace. *Indian Pediatr*.1992 Aug;29(8):979-84..