International Journal of Contemporary Pediatrics
Yadav S et al. Int J Contemp Pediatr. 2016 Aug;3(3):1001-1005
http://www.ijpediatrics.com
pISSN 2349-3283 | eISSN 2349-3291

DOI: http://dx.doi.org/10.18203/2349-3291.ijcp20162380

Research Article

Pattern of acute poisoning in children in a tertiary care hospital in eastern Nepal

Satish Yadav*, Shankar Prasad Yadav, Jyoti Agrawal, Gaurishankar Shah

Department of Pediatrics and Adolescent Medicine, BP Koirala Institute of Health Sciences, Dharan, Nepal

Received: 19 May 2016
Accepted: 02 July 2016

***Correspondence:**
Dr. Satish Yadav,
E-mail: doctorsat_99@hotmail.com

ABSTRACT

Background: Acute poisoning in children is a major preventable cause of morbidity and mortality. The purpose of this study is to analyze the current pattern of acute poisoning in children.
Methods: This study was a retrospective hospital based analysis of data in children with acute poisoning admitted from January 2013 to December 2013. The demographic profile and outcome were recorded and analyzed.
Results: A total number of 64 children (36 males & 28 females) were admitted with acute poisoning. It constituted 3.4% of the total admissions and 4.4% of the total deaths. The maximum number of children 25 (39.1%) was of the age group 1 to 5 years. Fifty-one (79.7%) were admitted in Ward and 13 (20.3%) in Pediatric Intensive Care Unit (PICU) among which 4 (6.25%) patients were put in mechanical ventilation. The most common poison involved was organophosphorus compounds 24 (37.5%) followed by mushroom 16 (25%) and kerosene 11 (17.2%). Mean time interval between ingestion and admission to hospital was 6.87 ±8.33 hours. The majority of the poisoning 28 (44%) occurred between 2pm to 7 pm. Forty-nine (76.6%) of the poisonings were non-intentional and 14 (21.6%) were intentional. Average duration of hospital stay was 4.14±1.94 days and vomiting was the commonest clinical manifestation. Of all the patients, 28 (43.8%) received pre-referral treatment, 44 (68.8%) antidotes and 22 (34.4%) gastric lavage.
Conclusions: In our study, most of the poisoning was non-intentional and 1 to 5 years old children were at greater risk for poisoning. The main substance was organophosphorus.

Keywords: Poisoning, Organophosphorus, Kerosene, Children

INTRODUCTION

A poison is any substance that causes harm to a living being and almost any substance can act as a poison if a sufficiently large dose is absorbed.[1] It is still an important public health problem in children and represents a large number of admissions in emergency units.

According to the WHO Global Burden of Disease project, an estimated 345 814 people of all ages died worldwide as a result of "accidental" poisoning in 2004. Although the most of these accidental poisonings were among adults, 13% occurred among children and young people under the age of 20 years.[2] A survey of 16 middle-income and high-income countries revealed that, unintentional injury death among children aged between 1 and 14 years, poisonings ranked fourth after road traffic crashes, fires and drowning.[3] Poisoning accounts 2% of all childhood deaths in the developed world and over 5% in the developing countries.[4] In India, the reported figures for fatal poisonings ranged between 0.6% and 11.6%.[5] A study done in Nepal shows that 1.79% of the total admissions and 6.38 % mortality of pediatric admissions were due to poisoning.[6]

The pattern and types of poisons vary in different parts of the world depending on various factors such as demography, education, socio-economic status, local

beliefs and customs. Thus each country needs specific epidemiological surveillance to determine the extent and pattern of the problem to take preventive measures. Hence, this hospital based study was done to describe the epidemiological profile and outcome, pattern, duration and the results of treatment of poisoned patients admitted to a pediatric department of BP Koirala Institute of Health Sciences (B.P.K.I.H.S), Dharan, Nepal.

METHODS

A retrospective study of cases was carried out at Department of Pediatric and Adolescence Medicine of B.P.K.I.H.S between January 2013 and December 2013 for 1 year. It is a tertiary center in eastern region of Nepal which has well equipped Pediatric department including PICU. The study materials included all the patients with acute poisoning admitted in this institute. Patients less than 1 month, poisonous bites and stings, idiosyncratic drug reactions and food poisoning were excluded from the study. The variables which were analysed were: age, gender, time interval between ingestion and arrival to hospital, month of admission, nature of poisoning, product, symptoms and signs, diagnostic and therapeutic interventions including requirement of ventilator support, duration of hospital stay and outcomes. Age was noted in complete year and further divide into three groups <1 year, 1-5 year, 5-10 year and >10 yr. If product is unknown then it was labelled as unknown product. The type of poisoning was categorized as intentional or non-intentional. Treatment measures like decontamination, gastric lavage, administration of activated charcoal, antidotes, any other medicine and the need of ventilator was mentioned. The outcomes were categorized according to the information obtained from case records as follows: (a) cure - patient without symptoms or patient discharged from hospital; (b) Left Against Medical Advice (LAMA) and (c) death.

All data were collected in predesigned data sheet and analysis was performed using Statistical Program for Social Sciences (SPSS) 11.5 version

RESULTS

Table 1: Distribution of cases according to age group and gender.

Age group	Male (%)	Female (%)	Total (%)
<1 year	5 (7.8)	3 (4.7)	8 (12.5)
1-5 year	12 (18.8)	13 (20.3)	25 (39.1)
5-10 years	6 (9.4)	2 (3.1)	8 (12.5)
>10 years	13 (20.3)	10 (15.6)	23 (35.9)
Total	36 (56.2)	28 (43.8)	64 (100)

During the study period 64 children were admitted with a clinical diagnosis of acute poisoning. This constituted 3.4% of the total admissions and 4.4% of total deaths among total admission. Male female ratio was 1.9 (36 Vs 28). Among all cases, 51 (79.7%) were admitted in Ward and 13 (20.3%) in PICU among which 4 (6.25%) patients were placed on mechanical ventilation. The mean (±SD) duration of hospitalization was 4.18 ±1.9 days. The most common month for poisoning was between May - July 21 i.e. (32.8%). The mean (± SD) age was 7.05 ± 4.9 years (range 90/365-14 years). The age and gender distribution of patients with poisoning are presented in Table 1. The distribution of poison cases according to types of poison, death and age group is as shown in Table 2. The common symptoms of poisoning are presented in Table 3.

The distribution of poison cases according to age group and nature is shown in Table 4. One poisoning was homicidal aged 3 months of organophosphorus poisoning by a relative due to family dispute. The mean time of admission to the pediatric emergency for our patients was 6.87±8.33 hours (Range from 1- 48 hr). Of all the patients, 28 (43.8%) received pre-referral treatment, 44 (68.8%) received antidotes and 22 (34.4%) gastric lavage. Specific antidotes were mainly for organophosphorus poisoning. Of the 3(4.6%) expired patients, 2 were due to mushroom and 1 was due to organophosphorus.

Table 2: Distribution of poison cases according to the type of poison, death and age group.

Type of poison	Admission n (%)	Death n (%)	Age group			
			<1 year	1-5 year	5-10 years	>10 years
Organophosphorus	24 (37.5)	1 (33.3)	2	4	5	13
Mushroom	16 (25)	2 (66.6)	1	7	3	5
Kerosene	11 (17.2)	0 (0)	5	5	0	1
Zinc phosphate	3 (4.7)	0 (0)	0	3	0	0
Olanzepine	2 (3.1)	0 (0)	0	2	0	0
Acid	1 (1.6)	0 (0)	0	0	0	1
Cannabis	1 (1.6)	0 (0)	0	0	0	1
Vitamin A	1 (1.6)	0 (0)	0	1	0	0
Warfarin overdose	1 (1.6)	0 (0)	0	0	0	1
Unknown	4 (6.2)	0 (0)	0	3	0	1
Total	64 (100)	3 (4.6)	8 (12.5)	25(39.1)	8(12.5)	23(35.9)

Table 3: Common clinical features of poison cases.

Symptoms	Number of cases (%)
Vomiting	28 (43.7)
Drowsiness	13 20.3)
Abdominal pain	12 (18.7)
Frothing	11 (17)
Unconsciousness	10 (15.6)
Fever	10 (15.6)
Loose stool	8 (12.5)
Difficulty in breathing	6 (9.3)
Seizure	5 (7.8)
Sweating	3 (4.6)
Lacremation	3 (4.6)
Rash	2 (3.1)
Fasciculation	2 (3.1)
Bleeding manifestation	1 (1.5)

Table 4: Distribution of poison cases according to age group and nature.

Age group	Non-intentional n (%)	Intentional n (%)	Homicidal n (%)	Total
<1 year	7 (87.5)	0 (0)	1 (12.5)	8
1-5 year	25 (100)	0 (0)	0 (0)	25
5-10 years	7 (87.5)	1 (12.5)	0 (0)	8
>10 years	10 (43.5)	13 (56.5)	0 (0)	23
Total (%)	49 (76.6)	14 (21.9)	1 (1.6)	64

DISCUSSION

Acute poisoning is an important clinical emergency and contributor to morbidity and mortality. Early diagnosis, treatment and prevention are crucial in reducing the burden of poisoning related injury in any country. The study recorded 64 cases of acute poisoning. Interestingly, the hospitalization rates for poisoning are almost same whereas mortality has decreased from 12.3% to 4.6% in the study institute.[7] This may be due to an increase in the number of private hospitals and nursing homes in the past years resulting in easy and nearby availability of health care centers and improvement in quality of care.

In our study majority of unintentional poisoning were of less than 5 year old children which are consistent with other studies.[8-10] Children under five years-old were the major risk group for unintentional poisoning due to their curiosity in exploring their surroundings, unable to differentiate between harmful and harmless substances and the regular hand to mouth contact that is common during this age group. Inadequate storage and easily accessible of poison are leading causes of unintentional poisoning in this age group.

In the present study 13 out of 14 were cases of intentional poising were of more than 10 years of age group. A similar pattern was observed in other studies.[11,12] Intentional ingestion of poison can be suicidal or just an adolescent cry for help. The possible risk factors are stress of school work, poor school performance, bullying at school, failure in relationship, conflicts with parents and associated psychological conditions. In our study, 6 suicide attempts occurred following conflict with family member and 2 due to poor performance in examination whereas in 6 cases the cause could not be determined.

In this study males are predominately more in all age group than females. Several other studies also show a male preponderance in childhood poisoning which support the finding of the present study.[13-15] This can be due to boys being more aggressive, active and curious than girls. However, there are a few studies which show female predominance. [16,17] A study from Turkey revealed that children above 10 years showed more poisoning in girls.[16]

Most common poisonings in the present study was due to organophosphorus compounds used as pesticides in farming which is similar to other studies carried out in Nepal.[18-20] The Eastern part of Nepal is a predominantly agricultural area with easy availability of insecticides in most rural households. These are mostly stored in empty colored bottles predisposing young children to accidently consume them. However, many studies from India implicate kerosene as the most frequently encountered poisons in pediatric cases which is the third most common poisoning in our study.[8,21]

Kerosene is used as a cooking fuel in our country by low income families and is stored in soft drink colored bottles usually within easy reach of children. Mushroom is the second most common poisoning in our study causing 2 deaths which consist of 12.5% of death among all admission due to mushroom. The previous study from this institute and Patan showed 30% and 33% mortality respectively.[6,7]

However, mortality is high as compared to other poisoning. Higher mortality in mushroom poisoning was most likely due to severe liver toxicity and late manifestation of symptoms leading to late arrival to emergency.

In the present study, the average time to presentation to the pediatric emergency was much higher (6.87±8.33 hours) than other studies.[22,23] This could be explained by the longer distance that these rural patients travelled to reach our centre. The alternative reason may be that most of these patients received initial treatment at a primary health care center (43.8%), before being referred to the centre.

Gastric lavage should be considered only within the first 60 minutes of ingestion and in cases where a potentially

life-threatening amount of poison was ingested.[24] Gastric lavage was performed in 34.4% of the poisoned patients. In one of the studies, the need for gastric lavage in severe poisoning cases was 48.7 %.[16] The cause of low performance of gastric lavage might be delay presentation at the center.

Poisoning is generally associated with higher morbidity than mortality. Some of the studies carried out in India mortality ranged from nil to 11.6% whereas in Pakistan it was found to be ranging between 2.5% to 13.6% which were comparable to the present study.[25,26]

CONCLUSION

This retrospective study concluded that substantial proportion of poisoning cases reported during the study period was unintentional and under five children. Therefore, strengthening poison awareness programs about safety issues to public particularly parents are needed for its prevention.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. World Health Organization Poisons. Available at http://www.who.int/topics/poisons/en/. Accessed 10 April 2016.
2. World Health Organization. World Report on Child Injury Prevention 2008. Available at http://www.whqlibdoc. who.int/publications/ 2008/9789241563574_eng.pdf. Accessed 28 April 2016.
3. Taft C, Paul H, Cionsunji R and Miller T.R. Childhood unintentional injury worldwide: meeting the challenge. Washington, DC, Safekids Worldwide, 2002. Available at www.usa.safekids.org/ContentPages/15804783.pdf. Accessed 18 April 2016.
4. Jepsen F, Ryan M. Poisoning in children. Curr Paediatr. 2005;15(7):563-8.
5. Dutta AK, Seth A, Goyal PK, Aggarwal V, Mittal SK, Sharma R, et al. Poisoning in children: Indian scenario. Indian Journal of Pediatrics, 1998;65:365-70.
6. Malla T, Malla KK, Rao KS, Gauchan E, Basnet S, Koirala DP. A Scenario of Poisoning in Children in Manipal Teaching Hospital. Journal of Nepal Pediatric Society. 2011;31(2):83-8.
7. Budhathoki S, Poudel P, Shah D, Bhatta NK, Dutta AK, Shah GS. et al. Clinical profile and outcome of children presenting with poisoning or intoxication: a hospital based study. Nepal Med Coll J. 2009;11(3):170-5.
8. Singh S, Singhi S, Sood N.K, Kumar L, Walia BNS. Changing Pattern of Childhood Poisoning (1970-1989): Experience of A Large North Indian Hospital. Indian Pediatrics. 1995;32(3):103-5.
9. Wiseman HM, Guest K, Murray VSG, Volans GN. Accidental poisoning in childhood: A multicentre survey. I. General epidemiology. Hum Exp Toxicol. 1987;6:293-301.
10. Singh S, Narang A, Walia BNS, Mehta S, Lata Kumar. Accidental poisoning in children: 10 years' experience. Indian Pediatr. 1981;18:163-6.
11. Chaudhry VP, Jalali AJ, Haidar G, Qureshi MA. Spectrum of acute poisoning among children in Afghanistan. Ann Trop Pediatr. 1987;7:278-81.
12. Kasilo OMJ, Nhachi FBC. A pattern of acute poisoning in children in urban Zimbabwe: Ten years' experience. Hum Exp Toxicol. 1992.11:335-40.
13. Kohli U, Kuttiat VS, Lodha R, Kabra SK. Profile of Childhood Poisoning at a Tertiary Care Centre in North India. Indian J Pediatr. 2008;75:791-4.
14. Adejuyigbe EA, Onayade AA, Senbanjo IO, Oseni SE. Childhood poisoning at the Obafemi Awolowo University Teaching Hospital, Ile-Ife, Nigeria. Niger J Med. 2002;11(4):183-6.
15. Oguche S, Bukbuk DN, Watila IM. Pattern of hospital admissions of children with poisoning in the Sudano- Sahelian North eastern Nigeria. Niger J Clin Pract. 2007;10(2):111-5.
16. Andiran N, Sarikayalar F. Pattern of acute poisonings in childhood in Ankara: what has changed in twenty years? Turk J Pediatr. 2004;46(2):147-52.
17. Pillai GK, Boland K, Jagdeo S, Persad K. Acute poisoning in children. Cases hospitalized during a three-year period in Trinidad. West Indian Med J. 2004;53(1):50-4.
18. Rani MA. Retrospective analysis of prole of acute poisoning cases in a tertiary care hospital in eastern Nepal: a four year data base from1994-1997. J Nep Med Assoc. 1999;38:23-8.
19. Kae KK, Nepal MK, Sharma SR, Pokharel RP. Poisoning cases at T.U. Teaching Hospital. J Inst Med. 1989;11:297-301.
20. Suvedi BK. A retrospective study of poisoning cases at Bir Hospital, Nepal. J Inst Med. 1990;12:296-302.
21. Gupta S, Govil YC, Misra PK,Nath R, Srivastava KL. Trends in poisoning in children: Experience at a large referral teaching hospital. The National medical Journal of India. 1998;4;166-8.
22. Khajeh A, Narouie B, Noori NM, Emamdadi A Ghasemi Rad MB, Kaykha M. Patterns of Acute Poisoning in Childhood and Relative Factors in Zahedan, Southeast Iran. Shiraz E-Medical Journal. 2012;13(3):19-27.
23. Talebian A, Droodgar A, Salehi E, Akbari H; Epidemiologic study of pediatric poisoning admitted in kashan shahid beheshti hospital. J Feiz. 2006;10(2):46-9.
24. Powers KS. Diagnosis and management of common toxic ingestions and inhalations. Pediatr Annals. 2000;29:330-42.

25. Babar MI, Bhait RA, Cheema ME: Kerosene oil poisoning in children. JCPSP. 2002;12(8):472-6.
26. Khandwala HE, Yusuf A, Hanafi IA, Yousofi A,Nizami SQ. Accidental Poisoning in Children in Karachi. PPJ. 1999;21(4):159-62.

Cite this article as: Yadav S, Yadav SP, Agrawal J, Shah G. Pattern of acute poisoning in children in a tertiary care hospital in eastern Nepal. Int J Contemp Pediatr 2016;3:1001-5.