DOI: 10.14260/jemds/2014/3554

ORIGINAL ARTICLE

ACUTE ACCIDENTAL POISONING IN CHILDREN: A HOSPITAL-BASED RETROSPECTIVE STUDY

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HOW TO CITE THIS ARTICLE:
Kameshore N, Singh K. B, Jibol W, Minita N. "Acute Accidental Poisoning in Children: A Hospital-Based Retrospective Study". Journal of Evolution of Medical and Dental Sciences 2014; Vol. 3, Issue 50, October 06; Page: 11812-11817, DOI: 10.14260/jemds/2014/3554

ABSTRACT: INTRODUCTION: Acute accidental poisoning in children is a big problem anywhere in the world. Studies done elsewhere in India showed a wide range of incidence of the problem. Hence, it was felt important to study its magnitude and associated characteristics as of now. **OBJECTIVE:** The current study was taken up to know the magnitude among children admitted in JNIMS, Imphal which is a newly established medical institute and also to study the characteristics like age, gender, type of poison, duration of hospital-stay and outcome of the cases. **MATERIALS & METHODS:** Retrospective data of all acute accidental poisoning cases among children admitted in the Pediatrics Ward, JNIMS, Imphal during the period July 2008 - December 2013 were analyzed by using descriptive statistics. **RESULT:** Of all the 13,663 children admitted, 148 cases were because of acute accidental poisoning giving an incidence rate of 1.08%. The male is to female ratio was 1.31:1. The last three years of the study period showed a slightly increasing trend in the incidence. Children aged 1-4 years were the most commonly affected (65.54%). Kerosene oil was by far the commonest (42%) of all the poisonous substances consumed. Food poisoning, poisoning with organic compounds, poisoning with medicinal drugs and poisoning with corrosives comprised 21%, 12%, 9% and 8% respectively of all the cases. There was no mortality. **DISCUSSION:** The incidence rate of 1.08% as found out from the current study was on the lower side as compared to reports of previous studies done in other parts of the country. Yet, it was two-fold of the incidence reported from RIMS which is situated in the same State. Parental negligence in storing poisonous substances in the household was implicated. They need to be made aware for keeping harmful poisonous substances in safe places out of the reach of children. **CONCLUSION:** Community-based studies are recommended for estimating more accurately the magnitude of the problem in the State.

KEYWORDS: Accidental poisoning, Kerosene oil, Fermented soya bean.

INTRODUCTION: Acute accidental poisoning is a world-wide problem representing a major cause of morbidity and mortality among children. Various studies done in many parts of India showed a wide range of 0.33% - 7.64% of the total hospital admissions being children admitted for it.[1-12] The studies showed an increasing trend in the recent years.[2] The present study was taken up to study the various characteristics of acute accidental poisoning among children reported and admitted in the Pediatrics Ward in Jawaharlal Nehru Institute of Medical Sciences (JNIMS) which was a newly established Medical College at Imphal, Manipur.

MATERIALS AND METHODS: Retrospective data were collected for all children admitted in the Pediatrics Ward, JNIMS, Imphal, Manipur during the last five and half years (July 2008 - December 2013). Data for children diagnosed and treated in the ward for acute accidental poisoning were analyzed in a descriptive way for various characteristics like age, gender, type of poison, duration of hospital-stay and outcome.

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RESULTS AND ANALYSIS: YEAR-WISE DISTRIBUTION OF CASES: A total number of 13,663 children were admitted in the Pediatric ward of JNIMS out of which 148 were because of acute accidental poisoning (1.08%). The yearly pattern showed a mild increasing trend in the last three years of the study (Table 1).

84 of all the cases were male children giving a male to female ratio of 1.31:1.

Year	Total No. of admissions	No. of poisoning cases (%)
2008	1045	11 (1.05)
2009	2453	26 (1.06)
2010	1941	18 (0.93)
2011	1873	22 (1.17)
2012	2504	28 (1.12)
2013	3847	43 (1.12)
Total	13663	148 (100)

Table 1: Yearly incidence of acute accidental poisoning

Age-wise distribution of cases: Two-thirds of all the cases were children aged between one up-to four years. The number of cases showed a declining trend as the age of children increased (Table 2).

Age groups (yrs)	No. of cases						
	In 2008	In 2009	In 2010	In 2011	In 2012	In 2013	Total (%)
0-1	1	0	2	0	2	0	5 (3.38)
1-4	6	18	15	15	17	26	97 (65.54)
4-8	3	8	1	6	5	15	38 (25.68)
8-12	1	0	0	1	4	2	8 (5.41)
Total	**11**	**26**	**18**	**22**	**28**	**43**	**148 (100)**

Table 2: Age-wise distribution of poisoning cases

Types of poisonous substances: The commonest type of poisoning was consumption of Kerosene oil (42%). And 50 cases (81%) of it occurred in children aged 1-4 years (Table 3). 31 Food poisoning cases (21% of all cases) encountered in children aged one year and above, occupied the second slot. Consumption of poisonous wild mushrooms available in the forest land and contaminated fermented soya beans (fermented soya bean being a locally relished menu), ingestion of castor seeds/oil and eating other contaminated food-items were the main causes of food poisoning.

18 cases (12% of all cases) of poisoning with organic compounds were seen. It was seen mainly in children aged 1-4 years (83%). 14 cases (9% of all cases) were because of consumption of medicinal drugs. The cases were mainly confined to children aged 1-4 years (64%). Notable among the medicinal drugs causing poisoning were Vitamin preparations, Anxiolytics, Aspirin, Antipsychotics etc.

12 cases (8% of all cases) were as a result of consumption of corrosives. Again, cases occurred mainly among children aged 1-4 years (58%). Consumption of caustic soda, sulphuric acid meant for

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recharging electrical batteries (almost each and every household in Manipur uses electrical battery and DC inverter as there is frequent electric load-shedding in the State), phenyl etc. were the main causes of poisoning. Other types of acute poisoning cases admitted were because of accidental consumption of boric acid powder and other unknown chemicals. These cases, again, were seen mostly in children aged 1-4 years (89%).

Type of poison	No. of Cases (%)	Age-Group (yrs)			
		<1	1-4	4-8	8-12
Petroleum products					
• Kerosene	62 (41.89)	3	50	9	-
• Diesel	1 (0.68)	1	-	-	-
Food poisoning					
• Mushroom	8 (5.41)	-	3	3	2
• Fermented soya bean	6 (4.05)	-	-	4	2
• Castor seed/oil	7 (4.73)	-	2	3	2
• Others	10 (5.76)	-	2	7	1
Organic compounds					
• Haldane	1 (0.68)	1	-	-	-
• Hydrocarbon	3 (2.03)	-	3	-	-
• Organ phosphorus	2 (1.35)	-	2	-	-
• Thinner/Spirit	9 (6.08)	-	8	1	-
• Mosquito repellent	1 (0.68)	-	1	-	-
• Cough syrup	2 (1.35)	-	1	1	-
Medicinal drugs					
• Vitamin preparations	4 (2.70)	-	2	2	-
• Antihypertensive	1 (0.68)	-	1	-	-
• Anxiolytics	3 (2.03)	-	2	1	-
• Aspirin	2 (1.35)	-	1	-	1
• Glycerin	1 (0.68)	-	1	-	-
• Bronchodilators	1 (0.68)	-	1	-	-
• Antipsychotic	2 (1.35)	-	1	1	-
Corrosives					
• Caustic soda	5 (3.38)	-	3	2	-
• Bleaching powder	1 (0.68)	-	1	-	-
• Baking powder	1 (0.68)	-	1	-	-
• Sulphuric acid	3 (2.03)	-	-	3	-
• Phenyl	2 (1.35)	-	2	-	-
Misc.					
• Boric acid	1 (0.68)	-	1	-	-
• Unknown chemicals	8 (5.41)	-	7	1	-
Total	**148 (100)**	**5**	**97**	**38**	**8**

Table 3: Types of poisonous substances

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OUTCOME: 32 (22%) cases were discharged after full recovery on the day of admission. 73 (49%), 25 (17%), 9 (6%) and 4 (3%) cases were discharged on the second, third, fourth and fifth day of admission, respectively after complete recovery. The maximum number of days taken for full recovery was seven days (one case, 0.68%). Two cases left against medical advice (LAMA) on the first day. Another one left on the fourth day against advice. There was no mortality. (Table 4)

Day of discharge	No. of Cases (%)	No. of Deaths (%)	LAMA (%)
1st Day	32 (21.62)	0	2 (1.35)
2nd Day	73 (49.32)	0	0
3rd Day	25 (16.89)	0	0
4th Day	9 (6.08)	0	1 (0.68)
5th Day	4 (2.70)	0	0
6th Day	1 (0.68)	0	0
7th Day	1 (0.68)	0	0

Table 4: Duration of hospital-stay and outcome

DISCUSSION: The cases of acute poisoning in children admitted in the ward were because of consumption of a wide range of poisonous substances viz., petroleum products, food poisoning, organic compounds, medicinal drugs and other chemicals. The incidence rate of 1.08% was on the lower side as compared to reports of other studies done in other parts of the country.[3-8,11] Yet, it was double of the reported figure of studies done in Regional Institute of Medical Sciences (RIMS) situated in the same State.[9,12]

The reason might be the expectation of better treatment services in the newly established medical college (JNIMS). Whether the incidence rate of acute poisoning in the State has increased or not, can be accurately found out only with a community-based study. The male and female ration of 1.31:1 from the present study was comparable to other studies done earlier cases.[1-12] The increased incidence among male children could be attributed to certain male characteristics like more adventurousness and activeness.

The present study finding of most of the poisoning cases (66%) occurring in children aged 1-4 years among all the cases was also comparable to study finding done elsewhere in the country. The increased agility and movement, craving for edible items to meet the rapid growth and development, lack of awareness of dangerous or poisonous items and relatively freer care-taking by parents might explain this fact. The last factor was indirectly supported by the very low incidence of poisoning among infants who are generally more strictly under parental supervision compared to other older children.

Consumption of Kerosene oil being the most common type of poisoning was also comparable to other studies done earlier. The need of each household for keeping it for purposes of cooking and lighting, the way they are stored in the house – in bottles with or without lids and in places easily accessible by children might explain it. Food poisoning by consumption of wild mushrooms and fermented soya beans were encountered in the present study. The State has vast forest areas where wild mushrooms grow. Poor farmers from the rural and hilly areas who cannot differentiate between edible and poisonous varieties might have collected it for household consumption.

Fermented soya bean is a staple food relished by the local people. In the process of fermentation and handling contaminations can take place causing food poisoning. The fact that, all food poisoning cases were children aged one year and above explains that these food preparations are for consumption by all family-members. The 12% incidence rate of organic compounds poisoning as found out from the present study was slightly higher than as reported by other earlier studies.

The storage of thinner, spirits and other organic compounds for occupational purposes in easily accessible places in the house and the resemblance of some of these poisonous substances to drinking water in colour might be the reason for this. The incidence rate of 9% for poisoning with medicinal items was also comparable with other studies done in the country. Most of the drugs were prescription drugs. Keeping the drugs in easily accessible sites and the attracting color of the drugs might lure the attention of the young children. Poisoning because of consumption of corrosives was found to be 8% of all the cases.

This was comparable to other study findings. Sulphuric acid used for recharging electrical batteries is a common asset to all the households in the State. It is colorless and as such, children might have assumed it to be water. The overall mortality rate at the study area was nil. Better treatment seeking behavior of the people, first-aid services provided by peripheral health facilities and quality treatment services at the study site might have contributed to this.

CONCLUSION: From the current study, it was seen that majority of the acute poisonings in children happened because of storing harmful or poisonous household items in places which were accessible by children. Parents need to be made aware so that they might be more careful in storing these substances safely in the house especially out of reach of children aged 1-4 years. As the study was a hospital-based study, the accurate incidence rate of the problem in the State could not be estimated. Community-based studies are recommended for the purpose.

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Date of Submission: 18/09/2014.
Date of Peer Review: 19/09/2014.
Date of Acceptance: 30/09/2014.
Date of Publishing: 04/10/2014.