

Seasonal Variation of Childhood Poisoning



Forensic Science

KEYWORDS : Season, Childhood, Acute poisoning.

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ABSTRACT

BACKGROUND - Acute poisoning is a common paediatric emergency & is one of the important causes of morbidity and mortality in children especially in developing countries.

AIMS- The cases were studied to see the seasonal variations and other epidemiological and clinical parameters in poisoning cases.

MATERIAL AND METHODS- A retrospective study was carried out in the paediatric ward of C.S.M.U Lucknow. Patient with history of ingestion of poison, intoxication or envenomation from August 2010 to July 2011 were enrolled. The cases were studied to see the seasonal variations and other epidemiological and clinical parameters. Total of hundred patients enrolled in the study were divided in four groups. Prevalence and type of poisoning was observed in winter, spring, summer and rainy seasons respectively.

RESULTS- A total of 100 cases of childhood acute poisoning were admitted during the study period. The most vulnerable age group was 1-3 years (39%). Males out-numbered Females (M-70%, F-30%). Kerosene poisoning was the commonest (27%). Poisoning cases were more common during summer season. Overall mortality was 4%.

CONCLUSION- Poisoning was common during the summer season and kerosene was found to be most common ingredient. It was possibly due to easy availability of kerosene and during the summer months thirsty children took this substance which was sometimes kept in the discarded container of soft drinks and mineral water bottles etc. People should be warned not to keep these toxic ingredients in such containers and within reach of the children.

INTRODUCTION

Poisoning continues to be a major and persistent cause of injury related morbidity and mortality in children and adolescents. Among the leading causes of injury, poison as a form of injurious agent stands 2nd with falls being the first and burns, drowning following on. Poisoning has also been the 3rd most common injury treated in emergency rooms for children less than 16 years of age ⁽¹³⁾ A study carried out in National Institute of Child Health, Pakistan in 1988 noted that 2.98% patients coming to casualty were with some forms of poisoning ⁽¹⁰⁾. Accidental poisoning is a problem of huge magnitude ⁽¹²⁾ and a persistent cause of injury related morbidity and mortality worldwide.

Toxic exposure has become one of the most common causes of acute medical illness in many countries. Around the world approximately 3 million acute poisoning & 2,20,000 deaths from pesticide exposure have been reported annually, occupational exposure, industrial chemical & pesticide, accidental or intentional exposure to household and pharmaceutical products and poisoning due to venomous animal, toxic, plants and food contamination all contribute to morbidity and mortality.

The pattern of poisoning varies from country to country and also in difference region of same country. In developing countries like India, Pakistan & Bangladesh, Insecticides & other household substance are the common causes of poisoning. This retrospective study was designed to see the pattern of childhood poisoning with respect to different age groups, gender discrimination, toxic agents and seasonal variation.

MATERIAL AND METHODS

A retrospective hospital based study was carried out on all cases admitted as suspected poisoning in Paediatric emergency of C.S.M. Medical University, Lucknow, from August 2010 to July 2011. Patient with history of ingestion of poison, intoxication or envenomation from August 2010 to July 2011 were enrolled. The patients were divided into seven age groups (a) less than 1 year, (b) 1-3 years, (c) 3-5 years, (d) 5-7 years, (e) 7-9 years, (f) 9-11 years (g) 11-14 years. Male, Female dis-

tinction and seasonal variation of poisoning was done. Four seasons were categorized like summer, autumn (rainy), winter and spring. 16th October to 15th January, 16 January to 15th April, 16th April to 15th July, 16th July to 15th October were considered as winter, spring, summer and rainy seasons respectively. Accordingly prevalence of type of poisoning in respect to season was observed.

RESULTS

Out of 100 cases, majority of childhood poisoning occur in the age group of 1-3 years (39%) and minimum in 7-9 yrs (5%). Eleven cases were less than 1 year of age, 12 were between 3-5 years & 5-7 years each, 5 cases were between 7-9 years, 14 cases between 9-11 yrs & 7 cases between 11-14 yrs age group.

Males outnumbered females (M=70%, F=30%) In majority of cases the route of intake of poison was oral (57%) followed by bites (41%) and lastly inhalation (2%). The study provided a correlation of incidence with age, sex, route of exposure, type of poisoning and season of the year when poisoning occurred, maximum no. of cases were found to be of Kerosene poisoning (27%). Out of total 100 cases, 10% cases in Spring, 27% in Summer, 38% in Autumn & 25% in Winter were found.

The incidence of poisoning was highest in rainy and lowest in spring season. A greater number of cases of kerosene poisoning are noted in summer season similarly snake and scorpion bite was highest in autumn (rainy season). 70% of cases recovered by Supportive treatment while 30 % by Specific treatment, of those 96% recovered & 4% expired & maximum mortality was with Organophosphorus poisoning (20%).

DISCUSSION

Acute poisoning is a common and urgent medical problem in all developed and developing countries of the world.⁽³⁾ In India, Poisoning approximately accounts for 10% of admissions in medical emergency. It was responsible for around 600,000 deaths in 1990s. After accidents and maternal mortality; sui-

cide by ingestion of pesticides agrochemical compounds is the leading cause of death in India especially among the young population. It is ranked as third leading cause of death in the age group of 15 – 44 years ⁽¹⁶⁾. This is mostly caused by the Organophosphates In developing countries, the mortality is much greater with high-case fatality up to 46% (generally more than 15%). Due to the extremely high intrinsic toxicity of the existing compounds, new chemicals of high potency and low toxicity continue to be developed for example, Imidacloprid, Pendimethalin, Pencycuron etc. They are classified as a 'moderate toxic', and generally demonstrate low human lethality but at times they may be hazardous. Complete ban on these highly toxic agrochemical compounds is not feasible therefore their substitution by the newer less toxic compounds in highly affected areas may be of great value^(17,18).

In children; Poisoning due to various agents showed the highest incidence in 1-3 years age group (39 %) The highest incidence in 1-3 years age group was consistence with other studies ^(15,4,11,1) The vulnerability of the preschool age group could be due to inherent inquisitiveness & high oral exploratory activity aided by their newly acquired mobility & hand skills. More so ever they are unable to discriminate between dangerous & safe products. Above 3 years of age there are fewer cases as these children can be warned against harmful products by a responsible caretaker

There was higher incidence of poisoning in males (70%) than in females (30%), corroborating other studies ^(14,2,5,8). The more active & restless nature of males as compared to female's counterpart could be responsible factor.

Kerosene was the main poison taken accidentally by the children in this study. Cosmetics and cleaning agents were the substances most frequently involved in the pediatric poisoning in other study ⁽⁶⁾ Kerosene was most frequently involved in our observation probably due to random use of this substance for cooking and lightening in the house and also in the agriculture work. This substance was contained in the soft drink or mineral water bottles. Younger children of age group 1-3 years who frequently consumed kerosene might have thought soft drinks or mineral water rather than kerosene in the container.

Summer was the most vulnerable period for poisoning in children and kerosene again was mostly consumed during this time. There was significant relation during this season with the kerosene. In the study by Matityahu & et al, most poisonings were observed to occur in summer and autumn as compared to other seasons.⁽⁷⁾ Summer was the dry season. Children became thirsty and took kerosene contained in the soft drink and mineral water unintentionally. Snake bite was seen more in rainy season. Death rate was 4.0% which was much lower than that of the other study by Rauf Ahmad & et al who observed 15 %. ⁽⁹⁾ This lower death rate might be due to accidental less intensive exposure of the children with poisoning substances. Clinical outcomes rely on early recognition, prompt referral and aggressive treatment in collaboration with different specialties.

Unintentional childhood poisoning would appear to be mainly due to accessible household substances kept in appropriate container and sub-optimal supervision. Parents need to be advised not to keep the house hold and agricultural used sub-

stances in a container also which attracts the children to consume it particularly in summer season. These should also be kept out of reach of the children. So increased public awareness of risks, especially of household products, could reduce the occurrence of accidental paediatric poisoning to a great extent.

Over last few decades poison control training and research centers have been created globally to encounter this problem. But unfortunately there is still a long way to go. The treating physicians should be vigilant and must have a close watch till full recovery. Though the appropriate and timely management has vital role,, the importance of preventive measures and public awareness also cannot be ignored in saving precious lives and should be implemented at different levels. Keeping in view these facts; this article is being presented to add in the existing volume of knowledge regarding childhood toxicity to save a number of precious lives.

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Conflicting Interest: None declared.

TABLE -1
AGE AND SEX DISTRIBUTION OF CASES

SERIAL NO.	AGE GROUP (YEARS)	MALE	FEMALE	TOTAL
1.	< 1yr	7	4	11
2.	1-3	30	9	39
3.	3-5	8	4	12
4.	5-7	9	3	12
5.	7-9	3	2	5
6.	9-11	8	6	14
7.	11-14	5	2	7
	Total	70	30	100

TABLE- 2
SEASONAL DISTRIBUTION OF CASES

SEASON	KEROSINE	SNAKE BITE	SCORPION BITE	ORGANO-PHOSPHORUS	OTHERS	TOTAL
Spring	6	0	1	0	3	10
Summer	10	9	5	1	2	27
Autumn	5	12	6	3	12	38
Winter	6	2	3	1	13	25
TOTAL	27	23	15	5	30	100

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