

## SEASONAL VARIATION OF CHILDHOOD ACUTE POISONING

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### ABSTRACT

**Objective:** Acute poisoning is a common medical emergency in paediatric unit. This was a retrospective study to see the seasonal variation of acute poisoning in children in a tertiary hospital.

**Methodology:** The study was done in Khulna Medical College Hospital from January 2004 to December 2005. The cases were studied to see the seasonal variations and other epidemiological and clinical parameters. One hundred ninety three 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 193(4.7%) cases of childhood acute poisoning were admitted. Out of them 107(55.4%) cases were male and rest 86(44.6%) were female. 1-3 years was the most vulnerable age group to be affected (P<.005). Kerosene was the commonest form of ingredient used. Poisoning cases were more common during summer season (P<.005). Overall mortality rate was 4.66%.

**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.

**KEY WORDS:** Season, Acute poisoning, Childhood.

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### INTRODUCTION

Childhood poisoning is a major problem for health authorities and is responsible for serious morbidity with mortality.<sup>1</sup> Toxic exposure has become one of the most common causes of acute medical illness in many countries.<sup>2</sup> Around the world approximately three million acute poisoning and 2,20,000 deaths from

pesticides exposure have been reported annually.<sup>3-5</sup> Occupational exposure to industrial chemicals and pesticides, 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.<sup>6</sup> The pattern of poisoning varies from country to country and also in different regions of same country. Copper sulphate poisoning was one of the most important acute suicidal poisoning in adult shown by Nazmul Ahasan and et al.<sup>7</sup> In developing countries like India, Pakistan and Bangladesh insecticides and other household substances are the common causes of poisoning.<sup>8</sup> 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.

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### PATIENTS AND METHODS

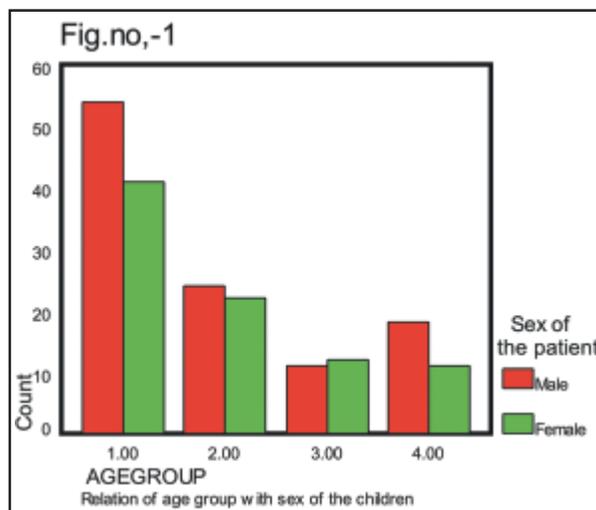
This retrospective study was carried out in the pediatric ward of Khulna Medical College Hospital, a tertiary hospital situated in the southern part of Bangladesh. The hospital medical records of all children with acute poisoning from January 2004 to December 2005 were included. The age range was between one to twelve years. Children were divided into four age groups i.e. Gr-1, Gr-2, Gr-3, Gr-4 having age range of 1-3, 4-6, 7-9, 10-12 year respectively. Male, Female distinction and seasonal variation of poisoning was done. Four seasons were categorized like summer, rainy, winter and spring. 16<sup>th</sup> October to 15<sup>th</sup> January, 16 January to 15<sup>th</sup> April, 16<sup>th</sup> April to 15<sup>th</sup> July, 16<sup>th</sup> July to 15<sup>th</sup> October were considered as winter, spring, summer and rainy seasons respectively. Accordingly prevalence of type of poisoning in respect to season was observed. Total patients admitted in the hospital was observed and among them percentage of acute poisoning was calculated.

The data on each patient was entered in to a desk top computer for analysis with the use of SPSS (statistical package for social science) version 10, statistical analysis was performed using chi- square test.

### RESULT

A total of 193(4.7%) cases of acute childhood poisoning were admitted in pediatric unit of Khulna Medical College Hospital during these years out of 4123 admission. Out of 193 children, 9 (4.66%) deaths were observed and 107(55.4%) male and 86(44.6) were female. Male: Female ratio was 1.25:1.

Fig-1 shows different age and sex distribution of cases. There were four age groups.



Gr-1= 1-3, Gr-2 = 4-6, Gr-3 =7-9 and Gr-4 = 10-12 years. Amongst them age group – 1 is the most vulnerable and frequently affected groups (49.2%) with male preponderance. Prevalence was lowest in the age group three and incidence among male was the lowest in this group.

Kerosene poisoning was the highest percentage of cases 55(28.5%) while lowest incidence was with copper sulphate poisoning 5(2.6%). Majority of the snake bite in this study was non venomous. Only 6 (14.4%) out of 42 was venomous. There was an association between the various types poison and age group. The incidence of poisoning was highest in the summer and lowest in the spring. In this study we observed that the kerosene was the most significant agent of poisoning in children of age group-I (P<.005). Table-I demonstrates seasonal variations with type of poisoning in children. There was a statistical significance between the season and poisoning (P<.005) A greater number of cases were observed in summer due to kerosene poisoning.

Table-I: Poison related to different seasons (n-193)

Season	Snake bite	Kerosine	Food	Organophosphorus poisoning (OPC)	Drug	Copper sulphate	Insectbite	Unknown	Total
Summer	15 (7.77)	33 (17.09)	7 (3.62)	9 (4.66)	4 (2.07)	2 (1.03)	3 (1.55)	8 (4.14)	81 (42.00)
Rainy	17 (8.8)	13 (6.73)	4 (2.07)	11 (5.69)	4 (2.07)	2 (1.03)	8 (4.14)	0 (0)	59 (30.6)
Winter	9 (4.66)	9 (4.66)	13 (6.73)	15 (7.77)	1 (.51)	1 (.51)	2 (1.03)	2 (1.03)	52 (26.9)
Spring	1 (.51)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (.51)

Figure within the parenthesis indicate percentage.

## DISCUSSION

Acute poisoning is a common and urgent medical problem in all developed and developing countries of the world.<sup>9</sup> In this study 4.7% of pediatric admission was due to acute poisoning. This was much higher than another study by Matityahu L & et al who found only 0.9%.<sup>10</sup> This difference might be due to easy exposure of the ingredients to the children in our community. Death rate was 4.66% which was much lower than that of the other study by Rauf Ahmad & et al who observed 15%.<sup>11</sup> This lower death rate might be due to accidental less intensive exposure of the children with poisoning substances. Majority of the children were male and age of poisoning was below three years. This was consistent with other studies by Abdollahi & et al.<sup>12</sup> The peak rate of poisoning in male and in this range was due to the interaction of increased activity and the lack of proper parental supervision which increased the vulnerability.

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 by the study shown by Litovotz TI & et al.<sup>13</sup> 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.<sup>10</sup> Summer was the dry season. Children became thirsty and took kerosene contained in the soft drink and mineral water

unintentionally. Snake bite in older children of age group 10-12 years was seen more in rainy season.

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 household and agricultural used substances 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.

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