

## **A multi-centric retrospective study of poisoning in children in 3 Medical College Hospitals across 3 different states in India**

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### **Abstract:**

**Introduction:** The prevalence and types of poisoning vary in different geographical locations.

**Objectives:** To study poisoning among children in 3 medical college centres across 3 different states in India.

**Method:** A multi-centric retrospective study was conducted from March 2013 to February 2014. The collected data was tabulated and analysed and results were evaluated.

**Results:** A total of 290 cases of poisoning in the 3 Medical Colleges was included in the study. Poisoning cases constituted about 1% of hospital admissions. The commonest age group was 1-5 years. Kerosene oil constituted 30.3% of poisoning cases. Snake bite envenomation constituted 10% of poisoning. Corrosive poisons constituted 7.5% and drugs 6.0% of poisoning. There were 12 deaths.

**Conclusions:** Kerosene oil was the commonest cause of poisoning in children in all 3 centres. Envenomation due to snake bites was the next common cause. Overall mortality rate was 4.1%.

(Key Words: Poisoning, children, India)

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### **Introduction**

Although, most cases of poisoning occur below the age of 5 years, worldwide<sup>1</sup>, the magnitude of the problem and fatality varies according to the socio-economic status, level of industrialization, agricultural activities, cultural practices related to supervision of children and local beliefs and customs<sup>1</sup>. These factors vary greatly according to regions in a vast and diverse country like India.

### **Objective**

To study poisoning among children in 3 medical college centres across 3 different states in India.

### **Method**

A one year retrospective study was designed to collect hospital admission data from 3 medical college hospitals in 3 different states across India, from March 2013 to February 2014. The hospitals were: College of Medicine & JNM Hospital (COM & JNMH), GSVM Medical College Kanpur and Manipal Institute of Medical Sciences, Sikkim. A proforma was developed to collect data such as age, sex, location (rural/ urban), specific type and mode of poisoning. Data was collected from the Paediatrics Admission Registers of the 3 medical college hospitals. All suspected 'poisoning' cases were included in the study.

### **Results**

A total of 296 cases of poisoning were enlisted in the 3 Medical Colleges but 6 Bed Head Tickets could not be retrieved at COM & JNMH. Thus, 290 cases of poisoning were included in study. Distribution of poisoning cases in the 3 Medical Colleges during study period is shown in Table 1.

**Table 1: Distribution of poisoning cases in the 3 Medical Colleges during study period**

Medical College	Total admissions	Poisoning No. (%)
COM & JNMH	5432	191 (1.5)
Kanpur	8053	83 (1.0)
Sikkim Manipal	1673	16 (1.0)

Sex distribution of the poisoning cases in the 3 centres is shown in Table 2. The location (rural / urban) of the poisoning is shown in Table 3. The age distribution of cases of poisoning is shown in Table 4. The mode of poisoning is shown in Table 5. The causes of poisoning in the 3 medical college hospitals are shown in Table 6.

**Table 2: Sex distribution of poisoning cases**

Medical College	Male No. (%)	Female No. (%)
COM & JNMH	106 (55.5)	85 (44.5)
Kanpur	58 (69.9)	25 (30.1)
Sikkim Manipal	12 (75.0)	04 (25.0)

**Table 3: Location (rural/urban) of poisoning**

Medical College	Rural No. (%)	Urban No. (%)
COM & JNMH	143 (74.9)	48 (25.1)
Kanpur	33 (39.8)	50 (60.2)
Sikkim Manipal	04 (25.0)	12 (75.0)

**Table 4: Age distribution of cases of poisoning in the 3 Medical Colleges**

Medical College	<1year Number (%)	1-5 years Number (%)	6-10 years Number (%)	>10 years Number (%)	Total Number (%)
COM & JNMH	06 (03.1)	131 (68.6)	29 (15.2)	25 (13.0)	191 (100)
Kanpur	00 (0)	52 (62.7)	24 (28.9)	07 (08.4)	83 (100)
Sikkim Manipal	01 (06.3)	15 (93.8)	00 (0)	00 (0)	16 (100)

**Table 5: Mode of poisoning in the 3 Medical Colleges**

Medical College	Accidental	Suicidal	Homicidal
COM & JNMH	188	03	00
Kanpur	71	12	00
Sikkim Manipal	16	00	00

**Table 6: Causes of poisoning in the 3 medical colleges**

Cause of poisoning	COM & JNMH n=191 No. (%)	Kanpur n=83 No. (%)	Sikkim Manipal n=16 No. (%)	Total n=290 No. (%)
Kerosene oil	61 (31.9)	22 (26.5)	05 (31.3)	88 (30.3)
Turpin Oil	16 (08.4)	00 (0.0)	01 (06.3)	17 (05.9)
Snake bite	21 (11.0)	08 (09.6)	00 (0.0)	29 (10.0)
Scorpion sting	00 (0.0)	10 (12.0)	00 (0.0)	10 (03.4)
Organophosphates	12 (06.3)	08 (09.6)	02 (12.5)	22 (07.6)
Carbamates	05 (02.6)	01 (01.2)	00 (0.0)	06 (02.1)
Acid	16 (08.4)	05 (06.0)	00 (0.0)	21 (07.2)
Alkali	01 (00.5)	00 (0.0)	00 (0.0)	01 (00.3)
Drugs	05 (02.6)	09 (10.8)	04 (25.0)	18 (06.2)
Rat Killer	05 (02.6)	00 (0.0)	00 (0.0)	05 (01.5)
Naphthalene	01 (00.5)	00 (0.0)	01 (06.3)	02 (00.6)
Dettol	01 (00.5)	00 (0.0)	00 (0.0)	01 (00.3)
Gutkha	02 (01.0)	00 (0.0)	00 (0.0)	02 (00.6)
Mosquito repellent	00 (0.0)	00 (0.0)	01 (06.3)	01 (00.3)
Hair dye	00 (0.0)	01 (01.2)	00 (0.0)	01 (00.3)
Datura	00 (0.0)	08 (09.6)	00 (0.0)	08 (02.8)
Plant seed	00 (0.0)	03 (03.6)	00 (0.0)	03 (00.9)
*Unknown bites	21 (11.0)	02 (02.4)	00 (0.0)	23 (07.9)
**Unknown	24 (12.6)	06 (07.2)	02 (12.5)	32 (11.0)
Total	191 (100)	83 (100)	16 (100)	290 (100)

\*Cases where despite definite history of sting / bite, offender could not be identified. \*\*Unknown poisoning cases occurred through ingestion but the material could not be identified.

Kerosene oil was the major cause of childhood poisoning in all three Medical Colleges constituting 30.3% of the total number of cases. Turpin oil, which is also a hydrocarbon, constituted 5-9% of the poisoning cases. Envenomation due to snake bite constituted 10% of poisoning whilst that due to scorpion sting constituted 3.4% of the poisoning cases. Drug poisoning constituted 6.2% of total poisoning. Of the corrosive poisons acid and alkali constituted 7.5% of the total.

There were 12 deaths giving an overall mortality rate of 4.1%. This comprised 5 (2.6%) cases from College of Medicine & JNMH Hospital, 6 (7.2%) cases from GSVM Medical College Hospital, Kanpur and 1 (6.3%) case from Manipal Institute of Medical Sciences, Sikkim. Among the 275 accidental poisoning cases there were 8 deaths giving a mortality rate of 2.9%. Among the 15 suicidal poisoning cases there were 4 deaths giving a mortality rate of 26.7%.

### Discussion

Poisoning in children is particularly common below 5 years of age<sup>1</sup>. In this multi-centric, retrospective study, we found out that the hospital admission rates (1.5%, 1% & 0.95% in COM & JNMH, Kanpur & Sikkim Manipal, respectively) due to poisoning and the predominant age groups were similar in all 3 centres conforming to previous studies<sup>1-3</sup>. Males were predominantly involved in all 3 centres. The difference in number of cases from rural and urban population varied in the 3 centres, probably due to different area of catchment.

Kerosene oil was the most common cause of poisoning in all three centres and this was in accordance with previous studies<sup>4-11</sup>. Turpin oil, a hydrocarbon like kerosene oil, accounted for 5.9% of total poisoning. Whilst envenomation due to snake bite was a feature in both COM & JNMH and GSVM Medical College Hospital, Kanpur, envenomation due to hornet stings was seen only in GSVM Medical College Hospital, Kanpur. In the 16 cases of poisoning seen in Sikkim Manipal there were no cases of envenomation. Drugs were a commoner cause of poisoning in Kanpur and Sikkim Manipal compared to COM & JNMH. This is probably due to a large percentage of children in those two centres coming from urban areas. This variation is however, not a feature of earlier studies<sup>12</sup>. Acid poisoning was the most common cause of corrosive poisoning among children accounting for 7.2% of total poisoning. The mortality rate varied from 2.6% to 7.2% in the 3 medical college hospitals.

### Conclusions

- Kerosene oil was the commonest cause of poisoning in children in all 3 centres.
- Envenomation due to snake bites was the second common cause of poisoning in this study.
- The overall mortality rate was 4.1% in the 3 medical college hospitals.

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