

## Epidemiological Study Of Acute Poisoning Among Children Admitted In RIMS, A Tertiary Care Hospital At Ranchi, Jharkhand.

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### Abstract

**Background:** Poisoning in children is a major public health issue worldwide. Pediatric poisoning is a preventable cause of morbidity & mortality in whole world. According to WHO the estimated death under age of 20yrs by acute poisoning is annually 45000. According to previous studies mortality rate of poisoning range from 3-5%. In developing countries like India these acute poisoning has major impact on economy of the country as well as quality of life of survivor and their family. The pattern of acute poisoning vary according to demographic profile. This study will help in planning proper preventive measures to lower down the morbidity and mortality.

**Material & Methods:** It was a retrospective, observational study done from January 2019 to December 2019 in department of Pediatrics, RIMS, Ranchi. Data were collected from MRD section, RIMS & transferred to standard form in Microsoft excel sheets for further evaluation. Data were analyzed for age, sex, ingested substance, intension, duration of hospital stay, secondary infection and final outcome.

**Results:** Total of 129 patients were presented with acute poisoning. Among them female are 56.6% and male account for 43.4%. In our study we found male predominance in children less than 5 yrs of age. Most common substance used for poisoning in our study is insecticides. Insecticides and hydrocarbon are more common among 0-4 yrs age group of patients. However hydrocarbon alone is more common among 5-10 yrs of age. As we go beyond 10 yrs of age we have seen that insecticides are most common poisoning substance. In adolescents group suicidal attempts was more common among females. 113 pts got discharged without sequalae, 8 pts died during treatment is our hospital.

**Conclusion:** Incidence of acute poisoning is higher in females than males. Most common substance used for poisoning is insecticide. suicide attempt is more common among females aged more 10yrs.

**Keywords:** Acute poisoning, Intentional poisoning, Suicide, Epidemiological study, Jharkhand

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### I. Introduction

Poisoning in children is a major public health issue worldwide. Pediatric poisoning is a preventable cause of morbidity & mortality in whole world. According to WHO the estimated death under age of 20yrs by acute poisoning is annually 45000. [1] The world wide studies shows poisoning mainly seen in children below 5yrs of age. [2] This poisoning incidence in childhood ranges from 0.33% to 7.6%. [3,4] Main cause of poisoning in infants are known to be error in medication given by the parents, then comes house sanitation products. [5] Among all studies most common substance for pediatric poisoning are insecticide, hydrocarbon, rodenticides, poisonous plant product and drugs etc. Poisoning is commonly seen in low socio-economic groups.

Since young children are very inquisitive and put most item in their mouth, so most common agent of poisoning are liquid eg. kerosene and open medications. On the other hand adolescents are more attracted towards drugs and weeds.

Pediatric patient who are poisoned by liquid agents are more prone to develop secondary infection which also results in prolong/increased hospital stay.

According to previous studies mortality rate of poisoning range from 3-5%. [5] Also it causes burden on health care services. In developing countries like India these acute poisoning has major impact on economy of the country as well as quality of life of survivor and their family.

The pattern of acute poisoning vary according to demographic profile. The data from Jharkhand state is not available, so there is a need to determine the epidemiological profile of acute poisoning in different age group and gender of children. This study will help in planning proper preventive measures to lower down the morbidity and mortality.

## II. Aims & Objectives

1. To assess the incidence rate of acute poisoning in pediatric patients.
2. To describe the epidemiology & pattern of acute poisoning in patients presented to pediatric department of RIMS,Ranchi.

## III. Methods

Study design:- Retrospective, Observational study.

Study duration:- January 2019 to December 2019.

Study location:- Department of Pediatrics, RIMS, Ranchi.

DATA COLLECTION:- Data were collected from MRD section, RIMS & transferred to standard form in Microsoft excel sheets for further evaluation.

Data were analyzed for age, sex, ingested substance, intension, duration of hospital stay, secondary infection and final outcome.

STATISTICAL ANALYSIS :- Data were analysed using SPSS- version 21.

INCLUSION CRITERIA:- Acute poisoning by any substance in pediatric patients

EXCLUSION CRITERIA:- 1) acute food poisoning patients

2) chronic poisoning patients

## IV. Results

Total number of patients admitted in pediatric department was 4856. Out of them 129 presented with acute poisoning.

**Gender distribution:**

**Table 1**

AGE GROUP(in Yr)→	0-4	5-10	>10	Total(129)
<b>Gender</b>				
<b>Male</b>	8	19	46	73
<b>Female</b>	14	21	21	56

Table 1 shows the gender distribution of cases. Total no. of female was 73 and total no. of male was 56. A major percentage (35.6%) of cases were female in the age group of 10-18 yrs. of age.

**Poisoning substances:**

**TABLE 2**

AGE GROUP(in Yr)→	0-4	5-10	>10	TOTAL(129)
<b>SUBSTANCE↓</b>				
<b>ACID</b>	<b>01</b>	<b>05</b>	<b>09</b>	<b>15</b>
<b>INSECTICIDE</b>	<b>08</b>	<b>04</b>	<b>26</b>	<b>38</b>
<b>HYDROCARBONS</b>	<b>07</b>	<b>16</b>	<b>09</b>	<b>32</b>
<b>POISONOUS PLANT</b>	<b>02</b>	<b>00</b>	<b>02</b>	<b>04</b>
<b>DRUGS</b>	<b>02</b>	<b>07</b>	<b>05</b>	<b>14</b>
<b>UNKNOWN SUBSTANCE</b>	<b>02</b>	<b>08</b>	<b>16</b>	<b>26</b>

Table 2 shows the distribution of poisonous substances used. The most common used substance was insecticides (29.4%) followed closely by hydrocarbons (24.8%).

**Intentions:**

**Table 3**

AGE GROUP(in Yr)→	0-4	5-10	>10	TOTAL(129)
<b>INTENTION↓</b>				
<b>ACCIDENTAL</b>	20	38	12	70
<b>HOMICIDE</b>	02	00	00	02
<b>SUICIDE</b>	00	02	55	57(37F+20M)

Table 3 shows distribution of intention of poisoning. Most of the cases (54.3%) were accidental a significant percentage (44.2%) of cases were suicidal in nature.

**Secondary infection:**

**Table 4**

AGE GROUP(in Yr)→	0-4	5-10	>10	TOTAL
<b>↑WBC</b>	03	06	01	10

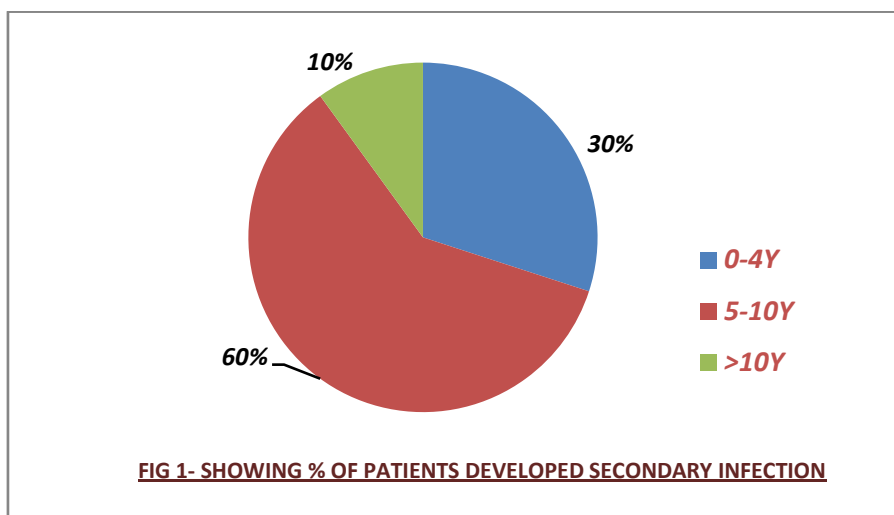


Table 4 & Figure 1 shows distribution of cases according to age group who developed secondary infection following poisoning.

**Outcome:**

**Table 5**

AGE GROUP(in Yr)→	0-4	5-10	>10	TOTAL
<b>OUTCOME↓</b>				
<b>DISCHARGE</b>	16	39	58	113
<b>TRANSFER</b>	01	01	06	08
<b>DEATH</b>	05	00	03	08

Table 5 shows the final outcome of poisoning cases. (87.6%) cases were successfully discharged whereas (6.2%) died.

**V. Discussion**

Poisoning is a common medical emergency among children. This is one of the leading causes of injury related to death among adolescents.

Among various studies it is seen that most exposures involve oral ingestion. These occur at home and mostly unintentional. There are very few community based data in India regarding the incidences of childhood poisoning.

Poisoning is a preventable cause of morbidity and mortality. In developing countries there is rapid industrialization and change in living condition without proportional increase in education and awareness. It is a major reason for poisoning due to industrial chemicals, medication, pesticides and insecticides.

In our study we have seen that during the study period total no. of cases related to childhood poisoning was 129. Among them female are 56.6% and male account for 43.4%. Out of 73 females 46 were of adolescent age group i.e. >10yrs of age. A study done in Turkey by Subiha Sahin et al in 2011, shows similar trend of female predominance.<sup>[7]</sup>

In our study we also found male predominance in children less than 5 yrs of age, which is comparable to the study done by Tsalkidis A et al in 2010 in Greece.<sup>[8]</sup>

Most common substance used for poisoning in our study is insecticides. It is most common in adolescent i.e >10yrs of age. Previous study also revealed age related patterns of causative agents. A study done by Ahmed B et.al in 2011 showed corrosives and pesticides as the most frequently used substances among adolescents.<sup>[9]</sup> These results are similar to our study.

Schemertmann et al in 2014 found that poisoning pattern changes with age.<sup>[10]</sup> As seen in our study insecticides and hydrocarbon are more common among 0-4 yrs age group of patients. However hydrocarbon alone is more common among 5-10 yrs of age. As we go beyond 10 yrs of age we have seen that insecticides are most common poisoning substance.

Study done by Bentur Y et al in 2010 found that younger children were more likely to be poisoned by the common household substance close to the floor, like kerosene, because they are easily accessible to young children.<sup>[11]</sup> Our study also shows similar pattern.

Bhatt N K et al in 2011 found that pesticides are most common agent for pediatric poisoning.<sup>[14]</sup>

In our study most common poisoning intention are accidental & suicidal where accidental poisoning is more common in patients below 10 yrs of age (N=38).

Suicide attempts are more common in patients with age more than 10 yrs (N=55). Female predominance was seen among these suicide attempts.

In adolescents group suicidal attempts was more common among females (N=37). A study done by Sonya M.S et al in 2016 found similar pattern.<sup>[12]</sup> They showed that unintentional poisoning was more common among pre-school and school age group. Adolescents predominantly attempted intentional exposures. Overall female gender was significantly associated with intentional poisoning either suicide or homicide this pattern is similar to our study.

Out of 129 patients 10 patients developed signs of secondary infection which were reflected by leukocytosis in their blood reports. 60% patients were among 5-10 yrs of age which were more exposed to hydrocarbon poisoning by household product. Fever and leucocytosis are common signs in patients with pneumonitis after hydrocarbon poisoning.<sup>[13]</sup>

In our study 113 pts got discharged without sequale, 8 pts died during treatment in our hospital. Here mortality rate is 6.2%. Various literature source shows mortality rate after acute poisoning is 0.48 to 75.6%.<sup>[5]</sup>

In our study 2 pts develop esophageal sequale after poisoning which is similar to the study done by Sabiha Sahin et al.<sup>[7]</sup>

#### **Limitation of our study:**

Our research also have some limitations. Since it is retrospective study, so all the medical data & files may not be recorded.

The duration of study is less, so to reach better conclusion further study of longer duration should be done.

## **VI. Conclusion**

In our study we found that incidence of acute poisoning is higher in females than males. Most common substance used for poisoning is insecticide. Accidental poisoning is more common in patients below 10 yrs. After 10 yrs suicide attempt is more common in which female predominance were seen.

#### **Conflicting of Interests:**

No conflict of interest was declared.

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## **References**

- [1]. Peden M, Oyegbite K, Ozanne-Smith J, et al., editors. World Report on Child Injury Prevention. World Health Organization, 2008
- [2]. Mowry JB, Spyker DA, Cantilena LR Jr, Jr et al. 2012 Annual Report of the American Association of Poison Control Centers' National Poison Data System (NPDS): 30th Annual Report. Clin Toxicol. 2013;51:949–1229.
- [3]. Agarwal V, Gupta A. Accidental poisoning in children. Indian Padiatr. 1984;11(9):617–21.
- [4]. Buch NA, Ahmed K, Sethi AS. Poisoning in children. Indian Padiatr. 1991;28(5):521–4.
- [5]. Mutlu M, Cansu A, Karakas T, et al. Pattern of pediatric poisoning in the east Karadeniz region between 2002–2006: increased suicide poisoning. Hum Exp Toxicol. 2010;29(2):131.
- [6]. Sabiha Sahin, MD, Kursat Bora Carman, MD, and Ener Cagri Dinleyici, MD - Acute Poisoning in Children; Data of a Pediatric Emergency Unit

- [7]. Tsalkidis A, Vaos G, Gardikis S, et al. Acute poisoning among children admitted to a regional university hospital in Northern Greece. *Cent Eur J Public Health*. 2010;18(4):219–23.
- [8]. Ahmed B, Fatmi Z, Siddiqui AR, Sheikh AL. Predictors of unintentional poisoning among children under 5 years of age in Karachi: a matched case control study. *Inj Prev*. 2011;17:27–32.
- [9]. Schmertmann M, Williamson A, Black D. Unintentional poisoning in young children: does developmental stage predict the type of substance accessed and ingested? *Child Care Health Dev*. 2014;40:50–59.
- [10]. Bentur Y, Obchirikov ND, Cahana A, et al. Pediatric poisonings in Israel: National Poison Center data. *Isr Med Assoc J*. 2010;12:554–559.
- [11]. Sonya M. S. Azab et al. Epidemiology of acute poisoning in children presenting to the poisoning treatment center at Ain Shams University in Cairo, Egypt, 2009–2013
- [12]. Mark A. Kostic, Nelson Text Book Of Pediatrics 20<sup>th</sup> Edition, Vol-1, Elsevier 2016, Chapter 63, Poisoning, Page 464.
- [13]. Bhat N K, Dhar M, Ahmad S, et al. Profile of poisoning in children and adolescents at a North Indian tertiary care centre. *JACM*. 2011;13: 37–42.

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