

**STUDY OF ETIOLOGICAL AND DEMOGRAPHIC CHARACTERISTICS OF  
HOUSEHOLD ACCIDENTAL POISONING IN CHILDREN AT COMMUNITY HEALTH  
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**ABSTRACT**

A retrospective analysis of all poisoning cases admitted to CHC Kotkhaj from Jan 2018 to Dec 2020 was done to study the pattern of poisoning reported. Accidental poisoning is a problem of huge magnitude and a persistent cause of injury related morbidity and mortality worldwide.<sup>[1]</sup> Once children reach the age of five years, unintentional injuries are the biggest threat to their survival. Unintentional injuries are also a major cause of disabilities, which can have a long-lasting impact on all facets of children's lives: relationships, learning and play. Among those children who live in poverty, the burden of injury is highest, as these children are less likely to benefit from the protective measures others may receive. Children's maturity and their interests and needs differ from adults. Therefore, simply reproducing injury prevention strategies that are relevant to adults does not adequately protect children. There are proven interventions such as child car seats, cycling helmets, child-resistant packaging for medications, fencing around swimming pools, hot water tap temperature regulation and window guards, to name a few. Objective of the study was to evaluate the pattern of poisoning at a primary care hospital at Shimla, and to study the socio-demographic profile of the same. Data collected using a pretested performa and the values were analyzed and presented.

**KEYWORDS:** Therefore, simply reproducing injury prevention strategies that are relevant to adults does not adequately protect children.

**INTRODUCTION**

Children are curious and explore their world with all their senses, including taste. As a result, home and its surroundings can be a dangerous place when the poisonous substances are ingested and thousands of the children are admitted in emergency department.<sup>[2]</sup> Poisoning patterns depends on age group, type of exposure, the nature and dose of the poison. New research indicates that various social and demographic factors like family size, socioeconomic status, attention to child as well as storage place of poison are important risk factors which significantly influence the acute household poisoning cases in children. Also factors such as parents education level especially of mothers, number of siblings, parents education, presenting symptoms and their outcome in terms of hospital stay and mortality are important. According to WHO, acute poisoning caused more than 45000 deaths in children and youth under 20 years of age- 13% of all fatal accidental poisonings worldwide.<sup>[3]</sup> Poisoning is the fourth biggest cause of unintentional injury after road traffic injuries, fires and drowning. Also poisoning agents in high and low income countries vary. Paraffin and kerosene, pharmaceuticals

and cleaning agents are more common poisoning in low and middle income countries whereas household products, pesticides are more common type of poisoning in high income countries.<sup>[4]</sup> Fatal poisoning rates are in low income and middle income countries are four times than that of high income countries.

An Asian study showed maternal employment and previous history of poisoning as significant risk factors for unintentional poisoning among children, with unavailability of poisons being a protective factor. The same study reported that poor maternal education, inadequate supervision of children, substance abuse, and mental illness in family members are risk factors that increase the incidence of poisoning in children. The study identified safe storage and health education on prevention of substance abuse as effective interventions for reducing the unintentional poisoning risk among children in the studied community.

Older children may be employed in the informal labour sector, in extractive metal industries that involve processing with toxic chemicals, or in agriculture, where

pesticides are used. Children living in poverty may scavenge in dump sites containing toxic waste. In all these cases, there is a strong likelihood of exposure to toxic substances, including lead, mercury and organophosphates.<sup>[8]</sup> Other children in the family, not directly involved in these activities, may come into contact with toxins brought into the home on the clothes or shoes of their siblings. Children may also be exposed to toxins leached into water or sprayed in the air.

Organic solvents (such as paint remover, glue and acetone), as well as diethylene glycol (a component of antifreeze), have also been implicated in mass unintentional poisonings of children through contaminated medicines or toiletries. In 1998, 109 children in Haiti fell ill after consuming paracetamol (known as acetaminophen in the United States) contaminated with diethylene glycol, and 85 of them died.<sup>[7]</sup> In similar incidents in Bangladesh, India, Nigeria and Panama, children were poisoned as a result of poorly regulated manufacturing processes.<sup>[7]</sup>

One of the hospitals in Delhi recorded a very high incidence (66.6%) of drug poisoning in children. The drugs consumed belonged to phenothiazines, antiepileptics and antipyretics. Iron poisoning was seen in younger children. Kerosene was one of the causes of accidental poisoning at all hospitals except Shimla and rural Maharashtra where probably wood charcoal is widely used. Pesticide poisoning was more prevalent in Punjab and West Bengal whereas plant poisoning was very common in Shimla.<sup>[10]</sup>

## METHODOLOGY

The present retrospective study was conducted by department of Medicine and Pediatrics from Jan 2018 to Dec 2020. Data was collected from all the poisoning cases presenting at CHC Kotkhai. Information was collected into a performa on the type of poison consumed, incidence on age and sex, socioeconomic status, hospitalization days were noted from records for each case and analyzed.

## RESULTS

In our study there were total of 75 patients brought to CHC Kotkhai, of whom the data were collected during the study due to suspected poisoning. Total number of male p-atients admitted to hospital due to poisoning was 42 and female were 33 with the male: female ratio being 1.2:1. Most of the children(66%) were above age of two years. 45 children had history of kerosene oil intake and 30 had history of intake of some medication. Of the 45 children in kerosene oil group, 23 were males and 22 were females, where 13 males and 17 females belonged to medicine group. Storage place of poison was investigated with 70% parents reporting that the poison was easily approachable. Education and knowledge of mothers was also evaluated. 72% were illiterate, 20% had high school education and only 8% were graduates. Majority belonged to poor class (85%), followed by

middle(15%) and none belonged to rich class. 45 children had siblings more than 3 and 30 had siblings less than three. Quantity of ingested poison by proper history from parents revealed that 60% of ingested poison was of minor amount. In our study 70% of families came to emergency within 2 to 3 hours and rest 30% after 3 hours.

## DISCUSSION

Poisoning morbidity is a significant problem. Accidental poisoning remains an important health issue in children globally especially in developing countries. This hospital based epidemiological study was carried out in CHC Kotkhai, Shimla where to the best of our knowledge, no pediatric study was carried out before. Age, sex ratio, agents responsible and other risk factors for accidental household poisoning are highlighted in the study.

Accidental poisoning occurs mostly between age group of 0 to 5 years with the peak age between 2 to 3 years. In our study, 34% children affected were under 2 years while 66% were in the range of 2 to 6 years. Children belonging to urban areas were more exposed compared to those in rural areas which could be due to the neglect of the child by the mother. Education of mother, the storage place of poison, number of siblings and number of family members also contribute to the accidental poisoning events.<sup>[5]</sup> According to Hjern et al, children with more than two siblings had a greater chance of all injuries as they got neglected, similar findings were noted in our study with 60% of the patients having greater than three siblings.

Agents responsible for childhood poisoning in our study were kerosene oil taking place with 60% cases, with medicines being the second common poisoning followed by bathroom cleaners. The high frequency of these two agents can be attributed due to their storage in coke bottles, a common household practice. Similarly, orange and pink coloured medicines attract children. It was also seen that most of the poisons were either easily approachable or were stored in coke bottles.<sup>[6]</sup> Medicines were kept on side tables unlocked and kerosene being kept in kitchen in edible containers.

This study holds important implications for public health and highlights the high prevalence of accidental poisonings in CHC Kotkhai. However their remains limitation due to the retrospective study, moreover due to the small sample size and since CHC receives patients from low income group, this may not represent the true statistics of the area of our study and can not be generalised for the whole population.

## CONCLUSION

We conclude that poisoning is a major public health problem in Shimla district, especially kerosene poisoning between age group of 2 to 6 years. Boys have higher rates of poisoning than girls. Also the low education status of mother and number of siblings more than three

are at greater risks. In most of the poisoning, 70% poison was within easy reach. This study highlights the fact that the negligence and carelessness of the parents lead to the cases of accidental poisoning. Poverty and malnutrition can also place children at risk of poisoning by forcing them to consume unsafe but cheaply obtained foods which are toxic. The ability to withstand toxic effects depends, among other factors, on the nutritional and health status of the child. Children living in poverty are generally inadequately nourished and therefore more vulnerable to poisons than their healthier counterparts. In addition, conditions of poverty frequently prevent people from accessing health care.<sup>[9]</sup>

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