

Original Research Article

Clinico- etiological profile of acute poisoning and intoxication in children in western Nepal

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ABSTRACT

Background: Pediatric poisoning is a common emergency. The present study was done to assess the incidence, clinico-etiological profile of acute poisoning and intoxication in children.

Methods: This study was conducted in the Department of Pediatrics, Lumbini Medical College and Teaching Hospital, Nepal in which children aged less than 18 years, with history of consumption of poison accompanied or unaccompanied by container or poison or with doubtful history of consumption of poison but with definite signs and symptoms of acute poisoning we included. We also included children with history of bites by poisonous creatures like snakes, scorpions, bees and insects or with doubtful history of bites due to poisonous creatures but with definite acute onset of signs and symptoms locally or systemically.

Results: In the present study, during the study duration, 68 children were included. The most common age group of included children was 1 to 5 years (59%). Accidental poisoning was reported in 93% of the cases, while the rest had suicidal poisonings. The most common type of poison used were different types of pesticides (46%). We observed that vomiting was the most common clinical presentation (79%). In our study sample, arrival of 46% of the children was delayed by 30 minutes to 2 hours. Majority of the patients arrived in the afternoon to the hospital (51%).

Conclusions: The findings of the present study would enable emergency physicians to identify clinical features of common poisonings among children, which would enable manage the cases better.

Keywords: Children, Emergency department, Poisoning, Toxicology

INTRODUCTION

Acute poisonings are a common cause of childhood accidents and this is evident from the number of emergency visits which happen due to this. As a result, a substantial amount of money is spent in managing these children. Over the recent years, rapid urbanization and over all standard of living, the household use of toxic cleaning compounds has increased tremendously. At the same time, use of pharmacological drugs has increased and many of these medicines remain unattended at home. Not only that, many time pharmacological drugs are sold

uncontrolled.¹ Among all accidents, poisonings are responsible for around 7% of all cases in children under 5 years of age, and are implicated in approximately 2% of deaths of children in developed countries.² Usually, the substances are either not toxic or minimally toxic, but in some cases immediate treatment may be required.³ Thus the emergency department staff should be familiar with the clinical presentations of common poisonings and their treatment. It can become challenging as even in the same geographical area, the etiology and clinical presentations of childhood poisoning may change over time.⁴ Thus regular surveillance is required to identify changing

trends.⁵ The present study was done to assess the incidence, clinic-etiological profile of acute poisoning and intoxication in children.

METHODS

Study design and sample population

The present study was a hospital based descriptive study conducted in the Department of Pediatrics, Lumbini Medical College and Teaching Hospital, Nepal from February 2016 till March 2017. We included children aged less than 18 years, with history of consumption of poison accompanied or unaccompanied by container or poison or with doubtful history of consumption of poison but with definite signs and symptoms of acute poisoning. We also included children with history of bites by poisonous creatures like snakes, scorpions, bees and insects or with doubtful history of bites due to poisonous creatures but with definite acute onset of signs and symptoms locally or systemically. We excluded children with food poisoning or idiosyncratic reactions to drugs. Parental consent was sought for children less than 7 years of age. For children aged 7 to 11 years, oral assent of the child in the presence of parent or legally authorized representative was taken. For children 12 to 18 years, written assent of the child was taken. The study was approved by the institutional ethics committee before commencement.

Data collection and data analysis

Data were collected using a pre-designed semi-structure study proforma. Data regarding age, sex, type of residence, occupation and education of parents, place of poisoning, socioeconomic status, route of exposure, manner of poisoning, type of poison, duration between consumption of poison/bite and onset of poisoning, time elapsed to reach emergency room, time of admission and clinical symptoms were collected. Detailed physical examination was done by the investigator. A detailed history of bite including type of bite, time of bite, site of bite, immediate manifestation was taken from each patient and from the witness. Detailed history regarding duration between poisoning and onset of symptoms, time elapsed between poisoning and arrival at emergency, time of admission was recorded. Socioeconomic status was categorized according to modified Kuppusswamy-socioeconomic status scale.

RESULTS

In the present study, during the study duration, 68 children were included. The most common age group of included children was 1 to 5 years (59%). Infants comprised 3%, children aged 6 to 10 years comprised 10% and 28% of the study population were aged 10 to 18 years. Female children comprised 46% of the study population and 46% of the children resided in urban areas. According to modified Kuppusswamy scale, none of the children were from upper class, 12% were from upper middle, 34% from

lower middle, 49% from upper lower and 6% were from lower class (Table 1).

Table 1: Baseline demographic characteristics of the children included in the study.

Demographic variables	Frequency	Percent
Age of child (years)		
Less than 1	2	3
1 to 5	40	59
6 to 10	7	10
10 to 18	19	28
Gender of child		
Female	31	46
Male	37	54
Type of residence		
Urban	31	46
Rural	37	54
Modified Kuppusswamy socioeconomic status		
Upper class	0	0
Upper middle	8	12
Lower middle	23	34
Upper lower	33	49
Lower class	4	6

Table 2: Poisoning related characteristics of the patients.

Variables	Frequency	Percent
Place of poisoning		
Own home	58	85
Field	7	10
Neighbour's home	3	4
Route of exposure		
Ingestion	58	85
Envenomation	10	15
Manner of poisoning		
Accidental	63	93
Suicidal	5	7
Type of poison		
Pesticides	31	46
Plants and evenomation	10	15
Hydrocarbon	8	12
Pharmacological drugs	6	9
Others	3	4

It was observed that 85% of the poisoning events took place in child's own home, 10% were in the open fields and rest 4% were in neighbour's home. Ingestion of poison was reported in 85% of the cases, while the rest had envenomation. Accidental poisoning was reported in 93% of the cases, while the rest had suicidal poisonings. The most common type of poison used were different types of pesticides (46%) (Table 2). Among the pesticides, the most common was organophosphorus 32.3% (22/68) followed by cypermethrin 7.3% (5/68), transfluthrin 2.94% (2/68), organochlorine 1.4% (1/68) and zinc phosphide 1.4%

(1/68). The second most common were plants and envenomation 14.7% (10/68) followed by hydrocarbon 11.8% (8/68), drugs 8.8% (6/68) and others 4.4% (3/68). Dhatura was the commonest among plants 11.7% (8/68). We observed that vomiting was the most common clinical presentation (79%). Other clinical presentations were pain in abdomen (22%), drowsiness (15%) and hyperactivity (12%). In our study sample, arrival of 46% of the children was delayed by 30 minutes to 2 hours. It was found that 37% had a delay of 2 to 6 hours and 15% had a delay of more than 6 hours. Only 3% of the children could arrive at the hospital in less than 30 minutes. Majority of the patients arrived in the afternoon to the hospital (51%) (Table 3).

Table 3: Clinical characteristics of the children included in the study.

Variables	Frequency	Percent
Clinical presentation		
Vomiting	54	79
Pain in abdomen	15	22
Drowsiness	10	15
Hyperactivity	8	12
Cough	7	10
Seizures	6	9
Difficulty in breathing	5	7
Local pathology	1	1
Delay in arrival to hospital		
Less than 30 minutes	2	3
30 minutes to 2 hours	31	46
2 to 6 hours	25	37
More than 6 hours	10	15
Time of day at admission		
Morning	13	19
Afternoon	35	51
Evening	20	29

DISCUSSION

In the present study, various demographic variables of the included children were assessed. The most common age group of included children was 1 to 5 years (59%) and female children comprised 46% of the study population. According to modified Kuppuswamy scale, 34% from lower middle and 49% from upper lower). In a similar study from Biratnagar, Nepal, Rimal et al observed that 52% were female children and 1 to 5 year age group comprised 53% of the study population.¹ The authors observed that 78% of the study sample were from low socioeconomic status family. Sil et al investigated the clinical and epidemiological characteristics of children aged 12 years or less with definite history of poisoning.² In their sample of 393 patients, 1 to 3 years age group comprised 59% of the study. In another study, Dayasiri et al reported demographic characteristics, poison related factors, clinical management and outcome following acute poisoning among children aged 9 months to 12 years in

rural Sri Lanka.³ In their study, 80% were aged less than 5 years and 60% were males. In a recent study from Chennai, India, Vasanthan et al determined the epidemiology, clinical profile, and outcome of children aged 1 month to 18 years presenting with acute poisoning.⁴ In their sample of 75 children, 37.3% were from 1 to 3 years of age. Furthermore, 93.3% of the cases were from urban areas and lower middle class (56%). In a recent study by Lee et al from Taiwan, 605 children aged less than 18 years were included. In their study, the most common age group involved was one and two years.⁵

We observed that 93% had accidental poisoning. Furthermore, it was observed that the most common type of poison used were different types of pesticides (46%). Among the pesticides, the most common was organophosphorus 32.3%. Dhatura was the commonest among plants 11.7%. Clinically, vomiting was the most common clinical presentation (79%). In the study by Rimal et al, accidental poisoning took place in 58% cases and organophosphorus was the most common type of poison (39%).⁶ In their study 42% of the children had suicidal poisoning, which highlighted the need for suicide prevention programs for children. In the study by Sil et al, 97.5% of the children were poisoned accidentally. In their study, hydrocarbons accounts for the maximum number of poisoning cases (38.9%).⁷ Organophosphates, organochlorines and carbamates accounted for 15.3% of the cases. In their study, gastrointestinal symptoms like vomiting, abdominal pain and diarrhea were the most common. Symptoms of central nervous system included seizures and altered sensorium. In a similar study by Dayasiri et al, 95.6% had accidental poisoning.⁸ The authors reported that household chemicals were the most common poisons. The most common poison was kerosene oil in all study settings. Medicinal agents lead to 25.3% and plant poisoning 20.0% of the poisoning events. Pesticides were the least common among all types of poisons and accounted for only 9.6% of the poisonings. In the study by Vasanthan et al, ingestion happened in 94.7% and accidental poisoning took place in 93.3% of the cases.⁹ Kerosene oil was the most common substance that led to poisoning (28.0%) followed by camphor (14.7%). The predominant system involved was the gastrointestinal system (34/75) followed by the central nervous system (29/75). The common presenting features of poisoning were vomiting (38.7%) followed by seizures in 22.7% of the patients. Lee et al reported that ingestion was the most common route.¹⁰

In our study sample, arrival of 46% of the children was delayed by 30 minutes to 2 hours. It was found that 37% had a delay of 2 to 6 hours and 15% had a delay of more than 6 hours. Only 3% of the children could arrive at the hospital in less than 30 minutes. Majority of the patients arrived in the afternoon to the hospital (51%). There were no mortalities in our sample of 68 children. This could be due to the reason that 93% of the poisonings were accidental. Sil et al reported that time interval to reach hospital ranged from 30 minutes to 18 hours, with an

average of 9.8 hours.⁷ Dayasiri et al reported that 38.9% of the children remained asymptomatic.⁸ The authors observed that 20% of the children developed symptoms within 30 minutes and 28.2% became symptomatic in 30 minutes to 1 hour. The most common reasons for delayed presentation at hospital was lack of concern by family members regarding the urgency of the situation (16.9%) and lack of knowledge regarding possible complications (16.7%). In the study by Lee et al, the most common time of day for visits was 6 pm to 12 pm (42.2%).¹⁰ Furthermore, of all cases, 68.4% were brought to the hospital within 4 hours of poisoning, including 15.1% who arrived within 1 hour of poisoning, 15.1% who arrived in the second hour and 38.3% who arrived in the subsequent 2 hours. A total of 119 patients (20.2%) arrived at the hospital later than 4 hours of poisoning and there was no documentation of timing for 67 cases (11.4%).

There are a few limitations of the present study. First, the modest sample size does not allow to us to generalize the findings of the present study to other geographical regions. Second, it is possible that some of the medical information could be incorrect as majority of this data were captured in the emergency department.

CONCLUSION

In the present study, the most common age group of included children was 1 to 5 years (59%). Female children comprised 46% of the study population and 46% of the children resided in urban areas. It was observed that 85% of the poisoning events took place in child's own home. Accidental poisoning was reported in 93% of the cases, while the rest had suicidal poisonings. Among the pesticides, the most common was organophosphorus. Vomiting was the most common clinical presentation. Arrival of 46% of the children was delayed by 30 minutes to 2 hours.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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