

## Original Article

# Epidemiology of acute poisoning among children in urban Sri Lanka: the experience of two tertiary care hospitals in Colombo district

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## Abstract

Acute poisoning in children is an important public health problem and one of the leading causes of emergency department admissions following childhood injuries. Although most paediatric ingestions are accidental, children are at a higher risk for serious complications following ingestion of a similar toxic dose compared to adults. The current study evaluated the recent patterns and trends in acute poisoning among children in two tertiary care centers in urban Sri Lanka: Lady Ridge Hospital for Children, Colombo and North Colombo Teaching Hospital, Ragama. Out of 200 cases, the majority were between 1-5 years and male children outnumbered female children. The most common poisons included kerosene oil, paracetamol and “Good Luck” plants. Complication rate was low, and no mortalities were reported. Deliberate poisoning accounted for 1% of total poisonings. The current trends in poisoning among children living in urban Sri Lanka showed decreasing incidence of pesticide poisonings and increasing incidence of pharmaceutical poisonings and poisoning with ornamental plants.

## Introduction

Acute poisoning in children is associated with increased yet largely preventable morbidity and mortality. Further, poisoning patterns and trends vary over the years in keeping with changes in socio-cultural practices and, availability and access of poisonous substances to young children (1). Compared to adults, children are at a higher risk for developing serious complications following ingestion of the same dose due to smaller body size, faster metabolic rate and lesser ability to neutralise the harmful substances (1). The majority of poisoning events in children are preventable and mostly occur within households or home surroundings (1). Acute poisoning is accidental in most children although deliberate poisoning is occasionally reported (1). Accidental poisoning occurs secondary to exploratory

behaviour, inability to recognise harmful substances from harmful substances, rapid neurocognitive development, curiosity of the surrounding and tendency for mouthing objects (1).

Acute poisoning is the fourth most common reason for paediatric emergency department admissions with injuries following trauma, burns and drowning in both South Asia and World (1,2). These statistics highlight the importance of conducting regular surveillances of children presenting with acute poisoning for optimisation of care.

This study aimed to describe the recent patterns and trends in acute poisoning among children in two tertiary care centers in urban Sri Lanka.

## Methods

The current observational cross-sectional study included all children admitted to Lady Ridgeway hospital, Colombo (LRH) and North Colombo Teaching Hospital (NCTH) over a period of two years (January 2020 to December 2021). Data regarding patient demographics, poison types and outcomes were collected retrospectively by trained medical graduates using a structured check list. The structured check list was developed by the principal investigator following careful examination of the medical records of twenty-five children with acute poisoning in the two tertiary care hospitals as a pilot study. Only limited demography and poison factor related data which could be considered reliable and auditable by discharge registers were collected.

Findings were compared and a comparison was made between the findings of the current study and similar studies performed in rural Sri Lanka. In addition, a comparison was also made with data available from the studies performed in the same settings more than two decades ago.

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Administrative clearance for the study was obtained by written approval to access medical records pertaining to children who presented with poisoning from the respective medical records departments by the medical directors of Lady Ridgeway hospital for children and North Colombo Teaching hospital, Ragama. All data were entered in SPSS 17.0 software.

## Results

Out of 200 children recruited to the study (NCTH – 116, LRH – 84), the majority were male (119, 59.5%, range 9 months – 14 years). Table 1 shows the age-wise breakdown of the study sample.

Table 1: Age distribution of the study sample

	LRH	NCTH	Total
< 1 year	7 (44.0%)	4 (50.0%)	11 (5.5%)
1-3 years	42 (36.2%)	38 (44.0%)	80 (40%)
3-5 years	33 (11.2%)	27 (3.6%)	60 (30%)
5-9 years	22 (8.6%)	9 (2.4%)	31 (15.5%)
9-14 years	12 (58.0%)	6 (42.0%)	18 (9.0%)

(LRH – Lady Ridgeway Hospital, NCTH – North Colombo Teaching Hospital)

Seventy percent of children belonged to 1-5 years age group. Poisoning was less commonly seen in children aged less than one year of age.

All poisonings occurred following ingestion and no cases were reported following eye instillation and skin contamination. The majority of poisonings occurred accidentally apart from two events of deliberate poisoning. The two deliberate poisoning events included ingestion of an antipsychotic and paracetamol by two teenagers. Table 2 shows the patterns of poisoning with different types of poisons in the two tertiary care hospitals.

Table 2: Patterns of poisoning with different types of poisons

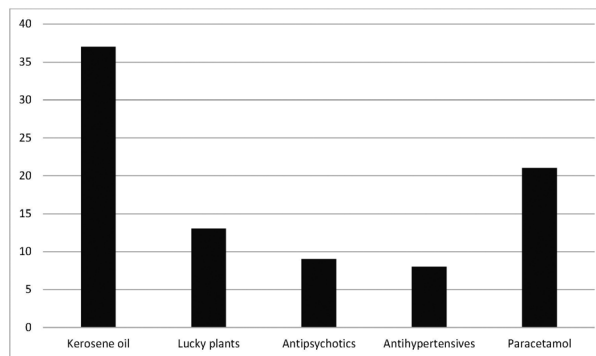
	LRH	NCTH	Total
Household chemicals	51 (44.0%)	42 (50.0%)	93 (46.5%)
Medicines	42 (36.2%)	37 (44.0%)	79 (39.5%)
Plants	13 (11.2%)	3 (3.6%)	16 (8.0%)
Miscellaneous poisons	10 (8.6%)	2 (2.4%)	12 (6.0%)
	116(58.0%)	84 (42.0%)	200 (100%)

(LRH – Lady Ridgeway Hospital, NCTH – North Colombo Teaching Hospital)

The most common poison type was household chemicals (93, 46.5%) whilst other poison types included

pharmaceutical agents (79, 39.5%), plants (16, 8%) and miscellaneous substances (12, 6%). Notably, no pesticide poisonings were observed. Figure 1 shows the most common poisons implicated in poisoning of children.

Figure 1: Common poisons implicated in poisoning of children.



Common poisons included kerosene oil (37, 18.5%), paracetamol (21, 10.5%), and “Good Luck” plants (*Zamioculcas zamiifolia*) that were thought to bring good fortune (13, 6.5%). Antipsychotics and antihypertensives were other common poisoning agents.

The majority of children were discharged following a period of observation whilst one child was admitted to intensive care unit for further management. No mortalities were reported.

## Discussion

The present study provides data useful for primary prevention of poisoning in children. The knowledge on common poisons among children is important for both parents and primary care physicians. The majority of children who ingested poisons in the current study belonged to 1-5 years age group. This finding was consistently seen in other studies (1).

Male children have been reported to be at a higher risk for having accidental poisoning. In our study, 59.5% of the sample comprised male children. Increased incidence of accidental poisoning in male children may be related differences in socialisation practices in the two genders. Parents tend to protect female children more compared male children within Asian socio-cultural contexts (1). Male children are encouraged to engage in outdoor and risk-taking activities and these child rearing practices may influence overall poisoning rates in the two genders.

Kerosene oil was the most common poison noted in this study. This finding was consistently seen in previous Sri Lankan and South Asian studies. High incidence

of poisoning with lucky plants was an interesting observation. These plants are considered expensive, ornamental plants by urban dwellers and grow them as indoor plants to make their surrounding look more modern and elegant. However, all parts of this plant are considered potentially toxic and serious complications can result in following ingestion of large quantities of the poison.

The overall complication rate was low in the current study and this finding was comparable with similar studies in other geographic regions (3).

Deliberate poisoning rate was 1% in the current study. The reasons for observing a low rate include the lower incidence of deliberate poisoning in the paediatric age group and the fact that current study involved children only up to 14 years. Multi-national studies which have assessed deliberate poisoning in children up to 18 years have reported higher incidences of deliberate poisoning mainly in the Western Pacific region and North America (4).

Data regarding childhood poisoning are vital information for planning preventative interventions. In this regard, many national poisoning information centers across the world accumulate data on profiles of children who present with poisoning annually (3). In Sri Lanka, an active surveillance mechanism for reporting children with poisoning is lacking. Availability of an active surveillance mechanism is likely to widen the understanding of the burden of poisoning in Sri Lankan children and help in formulating up-to-date guidelines of poisoning prevention.

## Conclusion

The current trends in poisoning among children living in urban Sri Lanka showed decreasing incidence of pesticide poisonings and increasing incidence of poisoning with pharmaceutical agents. Ornamental plants were the most common plants implicated in poisoning in urban regions compared to more toxic oleander plant poisonings observed in rural Sri Lanka. These changing trends in poisonings of children need careful documentation so that it allows for attention in the purview of planning effective preventative interventions.

## References

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