

## Original Articles

# Acute drug poisoning in children

G N Lucas

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### Abstract

**Objective** To study acute drug poisoning in Sri Lankan children.

**Design** A prospective hospital based study.

**Setting** Lady Ridgeway Hospital for Children, Colombo.

**Patients** Children with suspected acute drug poisoning admitted to hospital from January 1985 to January 2000.

**Results** There were 622 children with acute drug poisoning. 469 (75%) children were less than 4 years of age. 190 (30.5%) children had ingested drugs for local use, 135 (22%) had ingested anticonvulsants, 122 (19.5%) had ingested psychiatric drugs and 165 (26.5%) had ingested miscellaneous drugs. In 610 (98%) instances the drug ingestion took place indoors. In 81 (13%) cases the drug was mistakenly administered to the child by an adult. 28 (4.5%) children had ingested the drug due to mistaken identity. 25 (4%) children had deliberately ingested the drug. 3 (0.5%) children had been deliberately administered the drug by an adult. In 498 (80%) instances the drug was easily accessible to children. Lack of adult supervision was present in 523 (84%) cases.

**Outcome** There were 4 deaths. Mortality rate 0.6%.

### Introduction

Drug poisoning is a common accident of childhood but the outcome is rarely fatal<sup>1</sup>. In many instances, only small quantities of the drug are actually ingested and there may be uncertainty whether it will prove harmless or whether active measures should be promptly instituted<sup>2</sup>. Drugs account for over one half of reported poisonings in Germany, France, Italy, USA, England and Canada<sup>3</sup>. In a Sri Lankan study,

drugs accounted for 32% of childhood poisoning whilst household substances accounted for 56%<sup>4</sup>.

### Patients and methods

A prospective hospital based study was carried out on children admitted to the Lady Ridgeway Hospital with suspected drug poisoning from January 1985 to January 2000, a period of 15 years. A detailed history was obtained from the parent or relative accompanying the child. A complete physical examination was performed and appropriate investigations carried out. The children were observed during their hospital stay and the treatment given was noted.

### Results

During the study period 622 children were admitted to the Lady Ridgeway Hospital with acute drug poisoning. 355 (57%) were male and 267 (43%) were female. The ages ranged from 2 weeks to 12 weeks. The age distribution is shown in Table 1.

**Table 1 – Age distribution**

Age (years)	No. of children
<1	63 (10%)
1-3	406 (65%)
4-5	86 (65%)
6-12	67 (11%)

The drugs ingested by the children were classified into 5 groups as shown in Table 2.

**Table 2 – Classification into groups**

Group	No. of children
Drugs for local use	190 (30.5%)
Anticonvulsant drugs	135 (22.0%)
Psychiatric drugs	122(19.5%)
Miscellaneous drugs	165 (26.5%)
Unidentified drugs	10 (1.5%)

The drugs for local use ingested by children are shown in Table 3.

<sup>1</sup>Consultant Paediatrician, Lady Ridgeway Hospital, Colombo

**Table 3 – Drugs for local use**

Drug	No. of children
Skin disinfectants	99
Oils and liniments	42
Parasitocidal drugs	27
Nose/Ear/Eye drops	08
Antipruritic drugs	06

The anticonvulsants ingested by children are shown in Table 4.

**Table 4 – Anticonvulsant drugs**

Drug	No. of children
Phenobarbitone	72
Carbamazepine	26
Diazepam	16
Clonazepam	09
Phenytoin	04
Combinations	08

The psychiatric drugs ingested by children are shown in Table 5.

**Table 5– Psychiatric drugs**

Drug	No. of children
Trifluoperazine	44
Chlorpromazine	35
Haloperidol	07
Imipramine	06
Lorazepam	06
Amitriptyline	06
Flunitrazepam	02
Midazolam	01
Combinations	15

The miscellaneous drugs ingested by children are shown in Table 6.

**Table 6– Miscellaneous drugs**

Drug	No. of children
Antihistamines	34
Bronchodilators	34
Paracetamol	22
Antihypertensives	20
Oral contraceptives	16
Anti-diabetic drugs	09
NSAIDS	06
Iron preparations	05
Dapsone	04
Steroids	03
Antibiotics	03
Anthelmintics	02
Diuretics	02
Combinations	05

## The poisoning event

In 610 (98%) instances the poisoning took place inside the house whilst in 12 (2%) instances the tablets were picked up from the garden or road where had been carelessly thrown.

In 81 (13%) instances the drug had been mistakenly administered to the child by an adult. Such mistakes occurred because drugs for local application were kept in unlabelled containers in close proximity to the child's cough syrup or gripe water. Benzyl benzoate cream, Whitfield's lotion, surgical spirits, ephedrine nasal drops and hydrogen peroxide were some of the substances thus administered.

Twenty eight (4.5%) children had ingested the drug due mistaken identity. In 15 of these cases the drugs were mistaken for sweets because of their colour or chocolate coating. In the other 13 cases mistakes occurred because local applications were kept adjacent to syrups in similar containers.

Twenty five (4%) children in the 6-12 year age group deliberately ingested drugs after being scolded by their parents or after quarrelling with their siblings. Anticonvulsants and antipsychotic drugs were commonly used for this purpose and one child died.

In 3 (0.5%) instances drugs were deliberately administered to children by adults with homicidal intent. Phenobarbitone was the drug used in all 3 children and none of them died.

In 6 (1 %) cases drug poisoning occurred because the pharmacist had misread the prescription and issued the wrong drug. Lorazepam was given instead of albendazole, clonazepam instead of diazepam, amitriptyline instead of ampicillin, phenobarbitone instead of thyroxine, chlorhexidine with cetrimide solution instead of promethazine and cabamazepine instead of carbimazole.

In 498 (80%) instances the drugs were kept in places which were easily accessible to children such as the floor, low table, window sill or unlocked drawer whilst in 13 (2%) cases the child had climbed on to a chair and got at tablets kept on top of a cupboard.

Lack of adult supervision was a uniform feature. In 523 (84%) instances, at the time of the incident the child was alone in the room where the drug was kept.

## Clinical features

Impairment of consciousness ranging from drowsiness to coma was the commonest symptom occurring in 305 (49%) cases. Vomiting was present in 121 (19.5%) instances and ataxia was noted in 78 (12.5%) cases. Dystonic movements and oculogyric crises were seen in 35 (5.5%) children who had ingested trifluoperazine, chlorpromazine, prochlorperazine and haloperidol. Convulsions occurred in 17 (3%) children. Tachycardia and tremor were noted in 25 (4%) children who had ingested bronchodilators. Swelling of the lips and ulceration of the tongue were observed in 11 (2%) children who had ingested surgical spirits or potassium permanganate solution. Acidotic breathing was seen in 4 (0.6%) children who had ingested methyl salicylate liniment. Cardiac arrhythmias were noted in 2 (0.3%) children who ingested imipramine and methaemoglobinaemia occurred in a child who had ingested dapsone.

## Treatment

Two hundred and thirty six (38%) children were admitted to hospital within 2 hours of ingestion of the drug, 166 (27%) children between 2 and 4 hours and 220 (35%) children after 4 hours.

Ipecac emesis was resorted to in 40 (6.5%) instances, gastric lavage performed in 128 (20.50%) cases and activated charcoal used in 6 (1%) cases.

Forced alkaline diuresis was used in 41 (6.5%) cases of phenobarbitone poisoning and 2 (0.3%) cases of methyl salicylate poisoning.

Dystonic movements and oculogyric crises were treated with benzhexol. Anticonvulsants were used in children who developed fits.

Three hundred and seventeen (51%) children received no treatment being merely kept under observation.

## Deaths

Four deaths occurred in children with acute drug poisoning.

The first death occurred in an 18 month old boy who had accidentally ingested 30 tablets of imipramine which were in a cardboard box on the table. Half an hour later the child had become drowsy and had spontaneously vomited and some of the tablets were present in the vomitus. The child was admitted to the

Lady Ridgeway Hospital 3 1/2 hours after ingestion of the drug at which time he was deeply comatose with irregular respiration. He was mechanically ventilated in the intensive care unit and gastric lavage was performed with cuffed endotracheal tube. Subsequently he developed cardiac arrhythmias, hypotension and fits. Despite symptomatic therapy the child died after 9 days without regaining consciousness.

The second death occurred in a 10 year old girl who had deliberately ingested 43 tablets of phenobarbitone after being scolded by her mother. This happened in the night and it was only the next morning when she could not be woken up that the parents had got worried and brought her to hospital. The tablets were for the father and was kept in a drawer in the cupboard. On admission to hospital she was deeply unconscious with irregular respiration. She was treated in the intensive care unit with mechanical ventilation and forced alkaline diuresis but died within 24 hours.

The third and fourth deaths occurred in boys aged 4 and 4 1/2 years respectively who ingested an unknown quantity of methyl salicylate liniment and were brought to hospital within 4 hours of drug ingestion. They became deeply comatose with acidotic breathing. They developed recurrent convulsions. Despite gastric lavage with cuffed endotracheal tube, anticonvulsants and forced alkaline diuresis in the intensive care unit the children died within 24 hours.

## Discussion

The male predominance seen in my study is a feature common to most series of childhood poisoning<sup>2,4</sup>. It is only at 4 years that children understand simple safety rules and have good sense not to eat everything they come across<sup>3</sup>. In this study 75% children were under 4 years of age. Thus parents should strive for complete and instant obedience to rules of safety early in the child's life.

In government hospitals drugs for local application are dispensed into containers brought by the parents no labelling whatsoever is done. These unlabelled containers are often kept alongside the baby's cough syrup or gripe water bottle on the same shelf or table. It is thus not surprising that in this study 81 (13%) children were mistakenly administered local applications by an adult and a further 13 (2%) children mistook local applications for oral syrups. At the very least, a red warning label should be

affixed to these containers by the dispenser indicating that such preparations should not be taken orally.

Anticonvulsants and psychiatric drugs are usually prescribed on a fortnightly or monthly basis so that they are available in bulk in the house. Furthermore, children see adults taking these drugs on a regular basis and tend to imitate them. In this study 41 % children had ingested either an anticonvulsant or a psychiatric drug.

It is not certain that colouring and sugar coating play any decisive part in accidental drug poisoning in children. On the other hand it is obviously unwise to add attractions to tablets which are known to be harmful. In the present study 15 (2.5%) children ingested drugs thinking they were sweets.

Although 402 (64.5%) children were admitted to hospital within 4 hours of drug ingestion, ipecac emesis or gastric lavage was resorted to in only 168 (27%) instances as most children had ingested only small quantities of the drug.

The only measure that has been definitely shown to reduce the incidence of childhood poisoning is the use of child-resistant containers. Scherz, in an American study, reduced the number of poisoning episodes in a local community from 149 to 17 by the use of such containers<sup>3</sup>. In Sri Lanka, there is a place for dispensing psychiatric drugs and anticonvulsants in child-resistant containers.

Childhood poisoning deaths are uncommon'. In this series there were 4 deaths, giving a mortality rate of 0.6%.

In conclusion, some measures which may help to reduce acute drug poisoning in children are as follows:

1. People should be educated regarding the proper method of disposal of unused medicine. They should be advised not to throw unused tablets on to the garden or road but to flush them down a drain.
2. Parents should be advised against ingesting medicine in front of children as children are great imitators. They should also be told to always read the label on the bottle before giving medicine.

3. Dispensers in government hospitals should be instructed to label all medicine and to fix red warning labels on to all bottles containing preparations for local use.
4. Parents should be advised against storing medicine in gripe water bottles and cough syrup bottles as by so doing mistakes are bound to occur.
5. Parents should keep children in the toddler age group under strict supervision as drug poisoning chiefly occurs in this age group.
6. Drug manufacturers should desist from making drugs more attractive to children.
7. Psychiatric drugs and anticonvulsants which are prescribed on a fortnightly or monthly basis should preferably be dispensed in child-resistant containers.
8. Parents should be advised to store all medicine under lock and key.

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