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CHILDHOOD POISONING AT THE QUEEN ELIZABETH CENTRAL HOSPITAL, BLANTYRE, MALAWI
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ABSTRACT

***Objectives*: To record the number of children with poisoning admitted to the Queen Elizabeth Central Hospital over one year; to note the causes, clinical and laboratory findings and outcome of each poisoning event and; to highlight any preventable pattern in such events.**
***Design:* A one year prospective study was undertaken of all children admitted to the Queen Elizabeth Central Hospital with a history or clinical evidence of acute poisoning. Socio-demographic, clinical and laboratory data were recorded and outcome noted for each child on specially prepared forms. Data were entered and then analysed in Epi-Info 6.**
***Setting:* Department of Paediatrics, Queen Elizabeth Central Hospital, Blantyre, Malawi.**
***Interventions:* Children were treated for poisoning according to national guidelines; supportive care and active antidote were given as necessary.**
***Main outcome measures:* Length of stay in hospital and mortality were primary outcome measures.**
***Results:* One hundred and forty four cases were admitted, 118 (82%) were accidental, in 19 cases the reason was unknown and six (4.2%) were non accidental. Carbonate poisoning caused 32% (n=46) of admissions and paraffin 16.7% (n=24). The age range of poisoned children was three weeks to 14 years with a mean of four years and eight months. Eleven deaths occurred, six of which were due to traditional medicine intoxication.**
***Conclusion:* Most poisoning were preventable and the public needs to be made aware of the dangers of household agents, advised how to store them in the home and what to do if a child ingests a poisonous substance. Traditional medicines are particularly dangerous to give to infants less than one year old and carry a high mortality.**

INTRODUCTION

In the community, many incidents of childhood poisoning may be unreported or unsuspected, but the causes and burden of poisoning are reflected in the number of patients admitted to hospital with poisoning. If the causes of poisoning are known, the community and health care workers can be made aware of these dangers and learn how to prevent them. This study looks at causes, social-demographic factors, management, morbidity, mortality and means of prevention of childhood poisoning in a hospital in a developing country

The Queen Elizabeth Central Hospital (QECH) serves the Blantyre district in Southern Malawi, which has a population of 1.5 million. The children's outpatient clinic sees 200 to 800 patients daily, many of whom are self referred. It is a teaching hospital but the local populace often bypass health clinics to use it for primary health care. The paediatric unit admits about 12,000 patients annually of whom approximately ten per cent die. All patients with suspected or confirmed poisoning, regardless of the amount of substance involved are admitted for observation.

MATERIALS AND METHODS

A prospective study was carried out on all cases of suspected and proven cases of poisoning admitted to the paediatric wards of the Queen Elizabeth Central Hospital, Blantyre, Malawi, from January 1st to December 31st 1998. Demographic, clinical and laboratory data were recorded on all children who were admitted with a diagnosis of poisoning during the study period. Data were recorded on study forms and analysed using Microsoft Excel statistical packages (Appendix 1).

RESULTS

One hundred and forty four patients were included in the study, sixty seven (46. 5%) girls and 77 (53.5%) boys. The age range was three weeks to 14 years (mean age =4.8 years). Two of the patients had no age indicated. The highest incidence of poisoning was in the one to three year olds (n=47, 32.6%). The incidence decreased progressively with age so that only ten per cent of the patients were more than 9 years old. Ninety six patients (66.7%) were less than six years old (Table 1).

Table 1

Age distribution

Age	No. of patients	(%)
<1 year	16	11.2
1 - 3 years	47	32.6
4 - 6 years	33	22.9
7- 9 years	31	21.5
> 10 years	15	10.4
Unknown	2	1.4

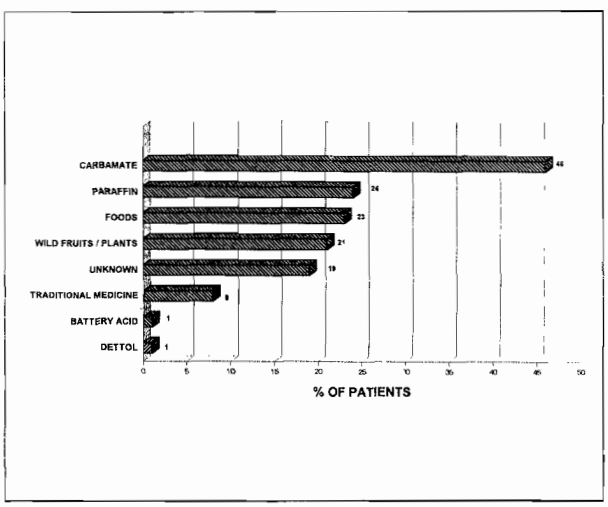
* The youngest patient was three weeks old and suspected to have been poisoned with carbonates by the neighbour.

The average number of monthly admissions was 12 with peak numbers in August , twenty five, July, nineteen and January, fifteen. The leading causes of poisoning were carbamate (n = 46, 32%) and paraffin (n= 24, 16.7%). Others were, foods, wild plants or fruits, traditional medicine, detergent, and battery acid. Poisoning was suspected but not confirmed in 14% of cases (Figure 1).

The most common presentation of all patients with poisoning was vomiting and diarrhoea (Table 2).

Figure 1

Type of poison (n=144)
(based on history from guardian)



Twenty four patients with paraffin poisoning were below, three years old and 19 (79%) were in the age group of one to three years. Carbamate poisoning occurred in all age groups, but was highest (n= 15, 28.3%) in the four to six year age group. Only two (4%) of the cases of carbamates poisoning were less than one year old. There were 21 cases of ingestion of wild plants and food poisoning and these were common in the older age group, eight (66.7%) were in seven to nine year age group and six (65.2%) in the four to six year age group. There was no incidence of food poisoning and only one of wild plant poisoning in a child less than one year old. In contrast, many of the traditional medicine intoxication (n = 5, 62.5%) were in the less than one year olds. One hundred and eighteen cases of poisoning (81.9%) were accidental. In 19 (13.2%), the cause was unknown and six (4.2%) were non-accidental or of malicious intent. Only one patient had taken rat poison deliberately after he had been found stealing some money.

Table 2

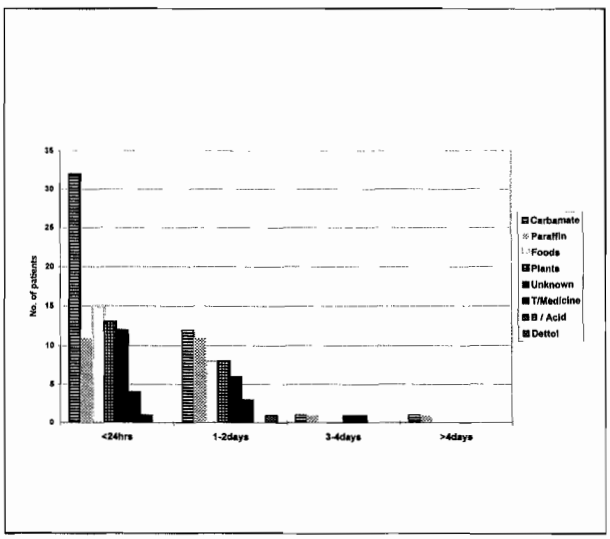
Clinical presentation of poisoning patients

Symptoms/signs	Percentage of patients			
	Carbamate	Paraffin	Food	Wild plants
Vomiting	56.1	37.5	10.0	66.2
Diarrhoea	43.5	12.5	78.3	28.6
Respiratory distress	17.4	33.3	4.3	–
Coughing	17.4	33.3	–	–
Secretions	23.9	8.3	47.8	23.8
Fasciculations	10.9	–	–	–
Pinpoint pupils	54.3	–	78.3	4.8
Low coma score	6.5	8.3	28.6	–
Low blood sugar	4.3	–	14.3	–
Acidotic breathing	2.2	8.3	–	–
Shock	2.2	–	–	–
Abdominal pain	–	–	4.3	–
None	4.3	33.3	4.3	9.5

Eighty nine (61.8%) of the patients were admitted for less than 24 hours, a further 49 (34%) were discharged within 48 hours. Six (4.2%) were kept in hospital for 3 or more days. All cases of poisoning due to wild plants, food, detergent and battery acid were discharged within 48 hours. One patient with carbamate poisoning stayed in hospital for seven days and required intensive care. One patient with paraffin poisoning stayed for five days as he had developed chemical pneumonitis (Figure 2).

Figure 2

Length of stay in the ward by types of poisoning (n=144)



First aid given at home was milk to 23 (16%)and salty water to three (2.1%) These remedies were given to induce vomiting. Most children (n= 118, 81.9%) did not receive

any first aid. Management of patients in the ward was mainly supportive. Seventy five children required intravenous fluids, 13 (9%) were given glucose and ten (6.8%) were given oxygen . The only antidote used was atropine, and fifteen (69%) of the cases of carbamate poisoning received doses of atropine. Fifteen of the 19 cases (78.9%) who were suspected to have poisoning, basing on clinical presentations also received atropine.

Eleven (7.6%) of the children died. Traditional medicine caused most deaths (six of eight cases (75%) and carbamates had the lowest figure, one death in 46 cases (2.2%). The death due to carbamate ingestion occurred on admission before any treatment could be given. All the children with traditional medicine intoxication were very sick on admission and herbs had been given mainly because the children had diarrhoea, fever, and were coughing. Two out of 24 children admitted for paraffin poisoning died; both had developed a chemical pneumonitis. Two of the patients who had no identifiable cause of poisoning died within 24 hours. One of them was given atropine and supportive care. Most deaths nine out of eleven, occurred within 24 hours of admission. No deaths occurred after three days.

DISCUSSION

Children with suspected or proven poisoning presented to hospital throughout the year. The leading causes of poisoning did not vary by season and the monthly variation in the number of cases was not significant. Previous studies have shown that the causes of accidental poisoning are related to the availability and accessibility of the substances involved(1). This finding is confirmed in our study. In Malawi, carbamates are used as rodenticides in the homes and children may ingest the rat baits. The same poison is also used for malicious and parasuicide attempts because it is cheap and readily available for buying in the streets. Many of the children with poisoning of unknown cause had signs and symptoms of carbamate poisoning and fifteen (79%) were managed as such. Therefore the true incidence of carbamate poisoning may be higher than noted in our study. However, the mortality is low and most children make rapid and complete recoveries. Paraffin is the major source of lighting in many homes and is usually stored in containers which previously stored food or drink. Young children mistake it for water or fizzy drinks. In contrast to studies done in the western world poisoning with pharmaceutical products is unusual(2). This maybe because most people do not keep many medicines at home, or store them where they are not accessible to children. Traditional drugs carry the highest mortality. They appear to have toxic active ingredients(3) and overdosage in children less than one year old is particularly hazardous. The children in the study were given the medicines because they were sick and the underlying infections may contribute to their poor outcome.

Some patients were given salty water or milk to induce vomiting. Salt may cause hypernatraemia and itself lead to an increase in mortality and morbidity(4). Vomiting in cases of paraffin and corrosives ingestion can increase the incidence of pneumonitis and ulceration of the oesophagus.

The cases of poisoning seen at QECH are mostly preventable. Preventive measures can include: a government policy of selling potentially toxic products in child resistant containers; restricting the sale of toxic substances in the streets; educating children about the possibility of poisoning by wild plants and eating or handling discarded products; educating the public about the storage of fresh foods, and making the community aware of the dangers of herbal medicine in children. It is a duty of the practitioner to make the public aware of the potential for poisoning, the appropriate means of management at home and the urgency of bringing the child to the hospital. Analysis of the chemical composition of common traditional drugs would help to eliminate the possibility of toxicity and identify issues about doses leading to toxicity. Even when resources are limited the deaths by poisoning can be reduced by careful supportive care, especially within the first twenty four hours of admission as shown in this study.

Appendix 1

Cases of poisoning admitted to Paediatric Dept, QECH

Hospital No: _____ Study No: _____

Date of admission: _____ Name: _____

Age: _____ Sex: M/F _____

Type of poison: _____

Amount taken: _____

Source of poison: _____

Social circumstances: _____

_____

Signs and symptoms on admission

Shocked Y/N Pulserate /min RR /min *Coma Score

Pupils pinpoint Y/N Secretions+/++/+++BP mmHg XBSugar

Vomiting Y/N Diarrhoea Y/N Acidotic breathing Y/N Abdo Distension Y/N

Others: _____

Approx time lapse between ingestion and treatment: _____

Management

IV fluids Y/N Atropine Y/N How many doses? _____
IV glucose Y/N

Length of stay in hospital _____

Outcome: Alive / dead / sequelae

Any other special points to add:

_____

_____

_____

*Coma Score

Best motor response-	localises pain	2
	withdraws from pain	1
	no response to pain	0
Best verbal response-	appropriate	2
	inappropriate	1
	none	0
Best eye movement-	follows	1
	not following	0

[x]Blood sugar levels - using a glucometer or colour change of glucose sticks

REFERENCES

1. Petridou E., Kouri N., Polychronopoulou A., Siafas K., Stoikidou M. and Trichopoulos D. Risk Factors for childhood poisoning: a case control study in Greece. *Injury Prevent:* 1996; **2**:208-11.
2. Petridou E., Polychonopoulou A., Kouri N, Karparthios T., Koussouri M. Messaritakis Y., Mathioudakis Y., Siafes K., Tsitsika H. and Zografos E. Unintentional childhood poisoning in Anthens: a mirror of consumerism. *J. Toxicology- Clinical toxicology.* 1997; **35**:669-75.
3. Keen R.W., Deacon A.C., Delves H.T., Morton J.A. and Trust P. G. Indian herbal remedies for diabetes as a cause of lead poisoning. *Postgrad. Med. J.* 1994; **70**:113-114.
4. Gossel T. A. and BrickerJ.D., Principles of Clinical Toxicology. Raven Press, New York. 1990.