

## A Retrospective Study of Childhood Poisoning in Kenya, 1991-93

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A literature survey revealed lack of adequate information on poisoning in Kenya, thus providing the impetus for the present work. In this, study, a 3 year retrospective survey of human poisoning in 19 Kenyan District, Provincial hospitals and Kenyatta National Hospital (KNH), representing approximately 40% of such public hospitals in the country, was carried out. Cases of poisoning were identified by diagnosis codes entered on hospital records at the time of discharge. A total of 1904 cases of poisoning were recorded and the information analyzed with particular focus on childhood poisoning. Distribution pattern with respect to poisoning agents, age and sex is presented. Children aged 0-5 years account for 29.78% while those aged 6-14 years account for 10.24% of cases of poisoning recorded. In the age group 0-5 years, Kerosine, drugs and organophosphates account for 41.09, 23.81 and 15.17% of poisoning cases respectively. It is concluded that any preventive measures targeted at children must focus on the 3 classes of poisons which together account for approximately 80% of all classes of poisoning in children.

**Key words:** Childhood poisoning

### INTRODUCTION

Poisoning in childhood occurs as a result of close association of 3 factors, namely, the child, the toxic substance and the environment. A literature review shows that nearly all cases of childhood poisoning are accidental and boys are more affected than girls [1,2]. In late childhood through to adolescence, self-poisoning is occasionally encountered. This involves deliberate ingestion of drugs or noxious substances as a means of escaping from or drawing attention to a difficult, uncertain and stressful situation, such as lack of parental attention or failure in examinations.

A retrospective study of poisoning in intensive care unit (ICU) of Kenyatta National Hospital (KNH) was carried out in 1980 [3]. The author retrieved and analyzed information on 72 patients treated for poisoning in the Intensive Care unit (ICU) Kenyatta National Hospital between August 1972 and April 1978. Organophosphates and chloroquine were highlighted as major poisoning agents. Children aged 0-5 years accounted for 34.75% of the total.

In 1984, a 4- months prospective study of poisoning in the same hospital (KNH) was carried out [4]. The author collected and analyzed information on 59 poisoned children in KNH over a 4 month period, September 1 to December 31, 1984. The most common poison agents, kerosine, organophosphates and

CNS depressants accounted for 18.6, 8.5 and 10.2% respectively. Children aged 0-5 years accounted for 73% of all cases of poisoning. Both studies [3,4] were very limited in scope but yielded some useful information regarding the pattern of poisoning in KNH. The hospital is a referral and University teaching hospital. The rationale for the present study was the realisation that there is lack of reliable data on the pattern of poisoning in Kenya and it was thought that the information would give a reflection of what is to be expected nationally.

The present study is a retrospective review of human poisoning in Kenya during 1991-1993 in which 19 representative District hospitals, Provincial hospitals and KNH were covered. The hospitals were selected in such away as to reflect diversity in culture, economic activities, climate and level of development. The 19 hospitals account for approximately 40% of all hospitals of comparable status in the country. District hospitals receive referred patients from health centres and dispensaries in the catchment area. In practice, there is not much difference between District and Provincial hospitals but theoretically the later are higher in status and receive referred patients, from the districts. Although the study involved many aspects, the present paper will focus on childhood poisoning.

## MATERIAL AND METHODS

During the month of May 1994, Pharmacy students, University of Nairobi were trained for 2 days on how to receive information from patients files in hospitals. They were then dispatched to 19 selected hospitals to commence the exercise of data collection. Prior to dispatching them, permission to collect the data was obtained from the Ministry of Health. The students carried introductory letters from the Faculty of Pharmacy, University of Nairobi. They were required to retrieve information on each patient comprehensively using a Poison Incident Report form, shown on figure 1.

The authors visited the students in the respective hospitals and checked some of the files to make sure the information on the incident report form was accurate. All files of patients admitted to these hospitals with some complaint of suspected poisoning were reviewed.

Cases of poisoning were identified by the diagnosis codes of the 9th edition of the International Classification of Diseases entered on the hospital records at the time of discharge against the name of every hospitalised patient.

At the end of the exercise, data collected was pooled and analyzed. The information highlighted in the present paper include poison or class of poison, age and sex of patient.

## RESULTS

Information on the 19 hospitals covered by the study and the number of poisoning cases from each hospital is summarised in Table 1. The distribution of poison agents according to age and sex of the patients is given in table 2. Out of a total of 762 (567 + 195) poisoned children aged 0-14 years surveyed, 422 representing 56% were boys. Of the total number of cases of poisoning, children in the age group 0-5 years account for 29.78% while those aged 6-14 years account for 10.24% thus giving a total of 40.02% for the age group 0-14 years. In the age group 0-5 years, kerosine, drug and organophosphate insecticides account for 41.09%, 23.81 and 15.71% respectively. Poisoning with all other pesticides account for approximately 4%, thus highlighting the importance of organophosphate as poisoning agent. Approximately 96.5% of the poisoning cases reported were due to single agents. The mortality rate for kerosine, drugs and organophosphates was 0, 8.53 and 9.94% respectively. Those poisoned with kerosine were hospitalised for a short period usually 1-2 days. Cases of poisoning were evenly distributed throughout the years. Most of cases of poisoning (78.6%) did not receive any form of treatment prior to hospital admission. The most common First Aid measure instituted was induced vomiting. All cases of poisoning in children aged 0-14 years were given as accidental.

## DISCUSSION

Cases of poisoning seen at District and Provincial hospitals were mostly those referred from health centres and dispensaries because they were considered sufficiently serious to warrant hospitalisation. Cases seen at KNH are referred from district and Provincial hospitals and occasionally from Missionary hospitals. It is reasonable to expect that many minor cases of poisoning are treated at the health centres and dispensaries and discharged because the clinical symptoms are transient. Any attempt to deduce the total number of cases of poisoning in Kenya, based on the present study would yield unreliable information.

There are too many variables and possible permutations involved for such an exercise to yield meaningful data. Even in countries such as Britain, USA and Canada where a network of Poison Control Centres (PCC) exist the total number of poisoned patients can not be ascertained. The relative importance of various poisoning agents is however discernible from the present study.

Treatment of poisoned patients is based on tentative diagnosis and very rarely confirmed by chemical analysis of specimens (blood, urine, vomitus, stomach wash etc). Thus it is only possible to identify the class of poison and not the specific poison, unless the container from which the poison was obtained is positively identified. There is no way a clinician can differentiate poisoning with diazinon from that with malathion, from clinical symptoms alone. Fortunately for many poison agents, it is not necessary to identify the specific poison before commencing treatment. Often the general principles pertaining to the treatment of poisoned patient (limiting further absorption, supportive and symptomatic treatment) are adequate and antidotes, where available only constitute part of treatment.

A good knowledge of possible poison agents in a particular area coupled with detailed case history is often the basis for diagnosis. Thus from our present knowledge, a rat poison in powder form, here in Kenya, invariably point to zinc phosphide.

In childhood poisoning, especially those aged 0-5 years, diagnosis is made easier by the fact that the child makes no attempt to conceal the container from which the poison was obtained. A knowledge of pattern of poisoning is important in instituting preventive measures. For example, poisoning by kerosine resulting from use of unmarked bottles, can easily be controlled by ensuring that such containers are not accessible to children.

The results of the present study are consistent with those reported in Uganda [5], Nigeria [6] and South Africa [7]. In all studies, children aged 0-5 years have been shown to be the most vulnerable to poisoning. Kerosine and organophosphates are highlighted in all these studies as major causes of childhood poisoning. Male preponderance is evident in the present study.

TABLE 1. Human poisoning in Kenya: hospitals and number of poisoning cases recorded\* in each hospital

Name of hospital	Ranking/status	Number of poisoning cases
1. Thika	District	213
2. Nyeri	Provincial	210
3. Kisii	District	149
4. Meru	District	126
5. Kakamega	Provincial	125
6. Naivasha	Sub-district	112
7. Migori	District	80
8. Coast	Provincial	78
9. Kajiado	District	69
10. Isiolo	District	51
11. Garissa	District	48
12. Wesu	District	45
13. Kiambu	District	37
14. Kitale	District	29
15. Kericho	District	27
16. Kisumu	Provincial	26
17. Kilifi	District	23
18. Chuka	District	16
19. KNH	Referral / university teaching	501
Total		1,995

\*61 incident reports forms (3.2% of the total) were rejected for having incomplete or contradictory information.

TABLE II. Human poisoning in 19 Kenyan hospitals: poison agent, age and sex distribution pattern

Poison agent	Age in years									
	Unknown		00-05		06-14		15-20		Over 21	
	M	F	M	F	M	F	M	F	M	F
<b>Drugs</b>										
Chloroquine	0	5	4	5	3	5	16	75	31	52
Alcohol	0	6	1	0	2	0	1	0	15	0
Others	19	5	65	60	7	10	12	31	48	36
<b>Household agents</b>										
Kerosine	1	2	141	92	6	1	2	7	1	5
Carbon monoxide	0	0	2	0	0	0	3	1	3	6
Others	2	2	8	5	0	2	3	9	12	10
<b>Pesticides</b>										
Organophosphates	40	22	44	42	26	21	60	48	143	68
organochlorines	0	1	0	0	1	0	1	0	0	0
Carbamates	0	0	1	0	0	0	1	0	1	1
Rat poison	9	6	5	5	3	2	7	11	16	20
Fungicides	1	0	1	4	1	1	1	0	2	0
Herbicides	0	0	4	4	4	1	3	9	13	9
Food poisoning	5	1	9	4	10	13	7	5	21	14
Plants	0	1	11	9	4	10	0	2	9	2
Venoms	3	5	19	13	28	24	19	18	40	39
Unclassified	0	0	3	4	5	2	4	4	10	8
Total number	80	56	320	247	102	93	143	222	367	274
	136		567		195		365		641	
% of total	8.1		29.8		10.3		19.2		33.7	

FIGURE 1. Poisoning incident report form

Centre .....

Time of admission ..... Date ..... Report No.....

Patients Name ..... Age ..... Weight ..... Sex .....

Occupation\* ..... Marital status .....

Name of product patient exposed to ..... Active ingredient(S) .....

Time since exposure: Oral      Skin      Inhalation

Amount of product patient exposed to .....

Time since exposure .....

Locality where incident occurred .....

Type of poisoning              Accidental

  Intentional (Homicide/suicide)

Chief complaint .....

Review of systems .....

Drug history/allergies .....

Prior therapy/First aid given .....

Assessment .....

Plan of action .....

Outcome/discharge summary .....

Laboratory results .....

Any other information .....

Name of officer taking history ..... Signature .....

Qualification .....

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