

Patterns of Acute Poisoning among Pediatric Patients at Kenyatta National Hospital, Nairobi between 2014 and 2017

K.A. SINEI* AND L.W. NDUNI

Department of Pharmacology and Pharmacognosy, School of Pharmacy, University of Nairobi.

Occurrences of poisoning continue to be reported in Kenya as well as in different parts of the world. Poisoning often occurs due to accidental or deliberate intake of an overdose of chemicals, medical drugs as well as plant or animal toxins. We investigated the recent patterns and extent of acute poisoning, complications and outcomes among pediatric patients treated in Kenyatta National Hospital. A cross-sectional retrospective study was conducted in the Pediatric Department. Data was collected from 142 files of pediatric patients aged 0-12 years old for the period 1st January 2014 - 30th June 2017. Data collected included age of the patient, gender, type of poison, circumstances of poisoning, clinical presentation, severity, management and outcomes. Results obtained indicated that the age group most affected was 0-5 years old and that males were more affected than females. Poisoning was mostly attributed to accidental intake. Kerosene, organophosphates and herbal drugs were the leading causative agents. It was found that 32.4% of the patients died from various complications arising from poisoning.

Key words: Poisoning, pediatric patients, Kenyatta National Hospital, kerosene, organophosphates, herbal drugs

INTRODUCTION

Cases of poisoning continue to be reported quite often in different parts of the world, Kenya included [1-4]. Serious cases have been highlighted in the media from time to time. Though several studies have been done and various measures have been proposed to control it, the problem still persists. Poisoning arises from taking an overdose of agricultural, household or industrial chemicals, any noxious chemicals and plant or animal toxins. It can also occur from an overdose of medical drugs taken either accidentally or intentionally. Poison can get into the body through various routes, such as, the skin, ingestion through the mouth and inhalation through the lungs. From their bites, animals or insects may inject their toxins through the skin directly into the body. Studies have shown that poisoning cases cuts across all age groups. Organophosphate pesticides have been reported to be the most common poisoning agent in agricultural setting in Kenya and some other countries [1-2, 4-8]. Circumstances of poisoning may range from suicide, homicide to accidental. Accidental poisoning in children is

the most common form and is often due to ingestion of medical drugs or household chemicals such as kerosene and detergents not stored out of their reach. Reports in the literature indicate that kerosene is the main poisoning agent in children aged 0-5 years old and that it is mainly due to accidental intake [2, 4]. However, few instances of suicidal intake have been reported, especially for older children aged 8 - 12 year of age.

Literature search indicated that no recent studies on patterns of poisoning in pediatric patients have been done in Kenyatta National Hospital (KNH). It was therefore of interest to carry out a study to find out if the patterns have changed over the years compared to earlier reports in the literature. The current study covered the period January 2014 – June 2017. This investigation also sought to find out the circumstances of poisoning, how the poisoning cases have been managed and the outcomes. These parameters had not been adequately investigated in earlier studies. The study was undertaken because it was considered important to gather data on recent trends of poisoning in KNH. It was hoped

*Author to whom correspondence may be addressed. Email: sinei@uonbi.ac.ke

that the results obtained may provide additional impetus to the efforts in designing strategies to minimize the problem, especially in children since they constitute a more vulnerable group.

METHODOLOGY

Study site and ethical approval

The study was carried out in the Paediatric Department at Kenyatta National Hospital (KNH). KNH is the largest university teaching and referral hospital in East and Central African region. It not only receives patients directly but serious cases are also referred from surrounding hospitals and Kenya at large when the need arises. It was therefore expected that the results obtained here will mirror those from the rest of the country. KNH was thus considered an appropriate study site.

Ethical approval for the study was granted by the KNH-UON Research and Ethics Committee (Ref. KNH-ERC/UA/8). Permission to access and collect data in Pediatrics Department was obtained from the Director of KNH (Ref. KNH PAEDS-AD/48 Vol 1).

Study design and data collection

A cross-sectional retrospective study was conducted in the Pediatric Department of Kenyatta National Hospital. Data was extracted from hospital records of pediatric patients aged 0 – 12 years who received treatment between 1st January 2014 and 30th June 2017. As calculated according to Cochrane formula [9], 142 files with complete information were retrieved and included in the study. Information extracted included the patient's age and gender, the type of poison, circumstance of poisoning, clinical presentation, severity, management and outcomes. Data was entered into a pre-designed collection form and later transferred to computer Microsoft Excel sheet (Microsoft Corporation, USA) for analysis.

RESULTS

The highest proportion of poisoning patients comprised the 0-5 age group (76.1%) followed by the 5-10 age group (18.3%) and finally the 10-12 age group (5.6%). Males recorded a higher percentage (56.3%) of poisoning cases than females. Accidental ingestion of the poisonous substance accounted for the vast majority of poisoning cases (95.8%), followed by suicide (2.8%) and, lastly, homicide (1.4%). The most common substances that caused poisoning are displayed in figure 1. Kerosene was the leading cause of poisoning (26.1%) followed by organophosphates (21.8%) and herbal drugs (16.2%). Minor causes of poisoning included carbon monoxide, medical drugs, food poisoning, snake venom, methanol and aflatoxin. The percentage of other substances in general, some of which were not identified, stood at 13.4%.

Fatalities arising from poisoning were significant, with 45 (32.4%) of the poisoned patients dying. Table 1 gives a breakdown of deaths according to causative poison. The highest number of deaths were due to kerosene (40%) followed by herbal drugs (24.4%), organophosphates (17.8%), carbon monoxide (6.7%), methanol (4.4%) and overdose of medical drugs (4.4%) in that order. Only one death out of the 45 fatalities (2.2%) was attributed to aflatoxin poisoning

Table 1. Type of poison and the number of deaths

Type of poison	No of deaths (%)
Kerosene	18 (40.0)
Herbal drugs	11 (24.4)
Organophosphates	8 (17.8)
Carbon monoxide	3 (6.7)
Methanol	2 (4.4)
Medical drugs	2 (4.4)
Aflatoxin	1 (2.2)
Total	45 (100)

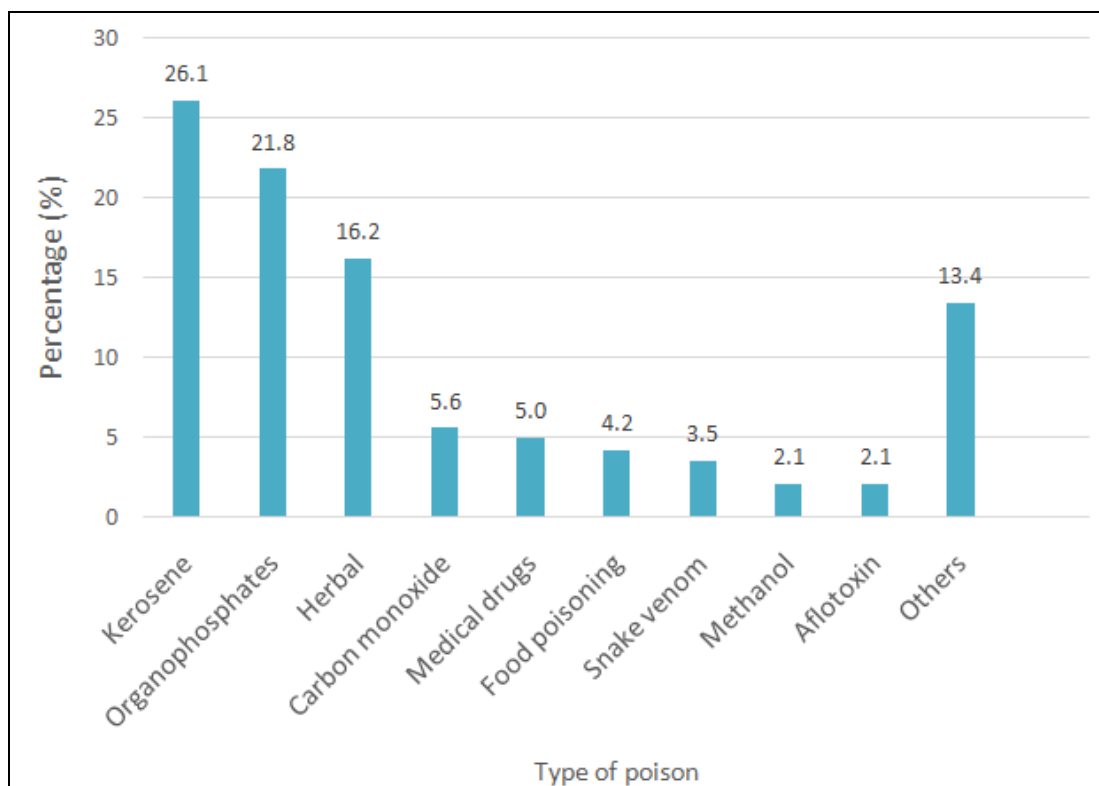


Figure 1: Classification of poisons

Table 2 displays the types of complications that arose due to poisoning by the different substances and the number of patients who developed complications. Management of poisoning, as noted from the records, was generally done according to standard guidelines and was deemed to have been adequate.

DISCUSSION

Results from this study show that the age group most vulnerable to poisoning was that of 0 -5 years and that more males were more affected than females. These results are generally in agreement with those in the literature [2, 4, 10]. In the present study, it was found that the most common circumstance of poisoning was accidental intake. The most prevalent causative substance was kerosene followed by organophosphates which are used as pesticides. These results are generally in tandem with those reported elsewhere [2, 4, 7]. Herbal drugs formed the third most common cause of poisoning. This was a new finding which had not been reported in the earlier studies quoted

above. It implies that these products are nowadays widely used in the homesteads but unfortunately are not kept out of the reach of children. In fourth place was carbon monoxide poisoning, followed by an assortment of medical drugs, food poisoning, snake venoms and aflatoxin, in that descending order. Carbon monoxide poisoning would most likely have been caused by charcoal stoves lit in poorly ventilated rooms where children stay or sleep. Snake venom would be expected to have arisen from snake bites which would be more common especially in rural areas. This is not surprising since KNH also receives patients referred from surrounding areas, some of which may be rural in setting. Aflatoxin poisoning could have arisen from consumption flour meal which had been poorly stored in a damp environment. Poisoning with methanol commonly occurs from intake of contaminated alcohol (ethanol); most likely illicit alcohol kept in the house where children were able to gain access to it. Some of the substances listed as “others” included household antiseptics, mushrooms, mould, soap and other unknown substances.

Table 2. Complications due to poisoning

Type of poison	No. of patients	Patients with complications (%)	% of patients with complications	Complication
Hydrocarbons	37	22 (59.5)	59.5	Aspiration; Pneumonia
Organophosphates	31	6 (19.4)	19.4	Convulsions
Herbal preparations	23	11 (47.8)	47.8	Sepsis; Acute kidney injury
Carbon monoxide	8	3 (37.5)	37.5	Organomegaly
Methanol	3	2 (66.7)	66.7	Metabolic acidosis
Aflatoxin	3	1 (33.3)	33.3	Acute kidney injury
Total	105	45	-	

Since the most prevalent cause of poisoning was noted to be accidental, these results imply that the causative agents except snake venom must have been present in the homestead but stored in such that it was easily accessible to the children. Some of the cases listed as suicide were children, especially those of 8-12 age groups who had argued with their parents for one reason or other and resorted to taking poison. Homicide cases were attributed to mothers who deliberately gave poisonous substances to their children due to domestic or social problems. Acaricides or pesticides were the most commonly utilized poisons for this purpose.

It was surprising to record that a large percentage (32.4%) of cases of poisoning led to fatality. Assuming that management measures were adequate in KNH (as noted above), it can be concluded that probably the patients were referred to the hospital already in serious condition when it was too late for them to benefit from management. Delay in treatment also probably led to complications which were noted to be high. Development of complications may have contributed to high level of fatalities. Thus death could have been due to amount of poison ingested, delay in receiving treatment from time of ingestion of poison or from complications that developed from poisoning.

CONCLUSION

In conclusion, this study has shown that cases of poisoning in children are quite high in KNH and that associated fatalities were also significant. The patterns of poisoning, however, have not

changed very much from those reported in the literature from earlier studies, except for the finding that poisoning from herbal drugs is now becoming a prominent and an emerging factor. The study has also highlighted the fact that poisoning in children can be caused by variety of substances, most of them probably easily accessible to children at home. It is, therefore, important to educate the general public on the need to store all medicines and any other potentially harmful substances away from the reach of children. Secondly, it is recommended that when poisoning occurs, immediate medical attention should be sought to minimize the high cases of complications and fatalities.

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