

ACCIDENTAL CHILDHOOD POISONING IN BENIN CITY: STILL A PROBLEM?

DOMINIC O. OSAGHAE¹ AND GODWIN SULE²

ABSTRACT

Accidental poisoning (AP) is a leading cause of ill – health and deaths among Nigerian children. Reports on AP are infrequent in Nigeria. This retrospective descriptive study examined the prevailing pattern of accidental childhood poisoning in Benin City. Accidental poisonings were identified in 226 (3.3%) of the cases during the 10 – year period. The children were aged 9 months to 5 years with peak age at 2 years and male to female ratio of 1.3: 1. The ingested poisons include Hydrocarbon (60.6%); Household products (16.4%); Alcohol (12.4%) and Drugs (8.8%). Seventeen (7.5%) children died. It is recommended that health education of parents and care givers should be intensified.

INTRODUCTION

Accidental poisoning is a leading cause of ill – health and deaths among Nigerian children.^{1 – 4} Types of poisons and the frequencies of poisonings tend to differ from one location of the country to another⁴⁻⁷ and various authors have proffered diverse recommendations on the prevention and control of accidental poisoning in children. Despite these efforts, Nigerian children continue to suffer the dire consequences of accidental poisoning. In addition, reports on accidental poisoning are infrequent in Nigeria. For example, the last report on poisoning in children in Benin City was 20 years ago by Olomu⁵. Moreover other reports on poisoning in children were

mostly from public health institutions with virtually none from private hospitals.

The present retrospective descriptive study was therefore undertaken to determine the prevailing pattern of accidental childhood poisoning presenting to a private hospital in Benin City with a view to ascertaining any changes and contribute to the body of knowledge on the subject matter.

SUBJECTS AND METHODS

Study site

The study was conducted in Modic Medical Centre, a private hospital established in 1992 in Benin City, Nigeria. The hospital is equipped with twenty beds, ten cots, three incubators, five phototherapy units and resuscitation equipment including suction machines, ambubags and oxygen therapy units. There is a laboratory in the institution manned by a qualified Laboratory Scientist and assistants. It is open 24 hours daily and provides all routine tests with blood banking facility. The institution is also provided with 30KVA generator and a

KEYWORD: Accident, poisoning, children, Benin City

*Dominic O. Osaghae*¹
Department of Paediatrics & Child Health:
Igbinedion University, Okada

*Godwin Sule*²
Modic Medical Centre:
7, Ugiayugbo Street, Off Akenzua, Benin City

Corresponding Author:
Dr Dominic. O Osaghae
Modic Medical Centre, 7 Ugiayugbo Street, Off Akenzua,
P O Box: 4488, Benin City
Phone No: + 2348037033044

hybrid solar system as alternative sources of electricity to the Power Holding Company of Nigeria. There is also a bore hole that supplies water to the facility.

The hospital is covered by a Consultant Paediatrician along with four Medical Officers, ten qualified nurses and four records staff as well as administrative and other supporting staff.

The institution essentially provides Paediatric services to families in Benin City and environs and receives referrals from other institutions including private and public health facilities.

Data retrieval and selection criteria

The records of children aged 5 years reporting to Modic Medical Centre, Benin City because of Accidental Poisoning over a 10 year period, from January 2002 to December 2011, was reviewed. Children that ingested orthodox and traditional drugs deliberately administered by parents for various reasons as well as those with food poisoning were excluded from the study.

The information obtained from the files includes bio data (age, gender, date of admission); poison ingested, and outcome. The data were analyzed and presented in means, ranges, percentages and charts.

RESULTS

Pattern and Prevalence of admissions

There were 6874 Paediatric admissions to MMC during the 10- year period of the study and the mean yearly and ranges of admissions for the periods was 687 (558 - 831). The yearly admission is shown in Figure I.

Gender and Age Distribution

Accidental poisonings were identified in 226 (3.3%) of the cases during the 10 – year period. The gender and age distribution

were available in 202 (89.4%) children made up of 115 boys and 87 girls with male to female ratio of 1.3 to 1 and were aged 9 months to 5 years with a peak at 2 years. One hundred and seventy three (85.6%) of them were aged 2 years or less.

Types of poison

Hydrocarbons were responsible for 137 (60.6%) of the cases and was made up of kerosene 127 (56.2%) and petrol 10 (4.4%). The other poisons include Household products 37 (16.4%); Alcohol 28 (12.4%); Drugs 20 (8.8%) and Caustic soda 4 (1.8%). The pattern of poisoning is shown in Figure II.

The household products comprised of bleach, common salt, cosmetic items, perfume, insecticide, floor cleaners, button, batteries and other unidentified agents.

The drugs were Methyl dopa (Aldomet), Amoxicillin, Chlorpromazine, Diazepam, Ferrous sulphate (Fersolate), Metformin (Glucophage), Imipramine, Paracetamol, Promethazine, Quinine tablets.

Storage of poisons

Kerosene and alcohol were stored in empty bottles of assorted drinks comprising coca cola, fanta, beer, water and empty cups and jerry cans. The house hold products were in uncovered or partially damaged manufacturer's containers. The drugs were found on the floor, bed side tables and lockers, chairs and unsealed envelopes.

Clinical Features

In Kerosene poisoning, the amount ingested by the children was not documented and it was not possible to relate it to the presenting features. The symptoms were cough and breathlessness (95%), fever (82%), restlessness (68%) and diarrhea (12%). The signs were hyperpyrexia (90%), dyspnoea and crepitations (90%), rhonchi (24%), impaired consciousness (9%),

Figure I

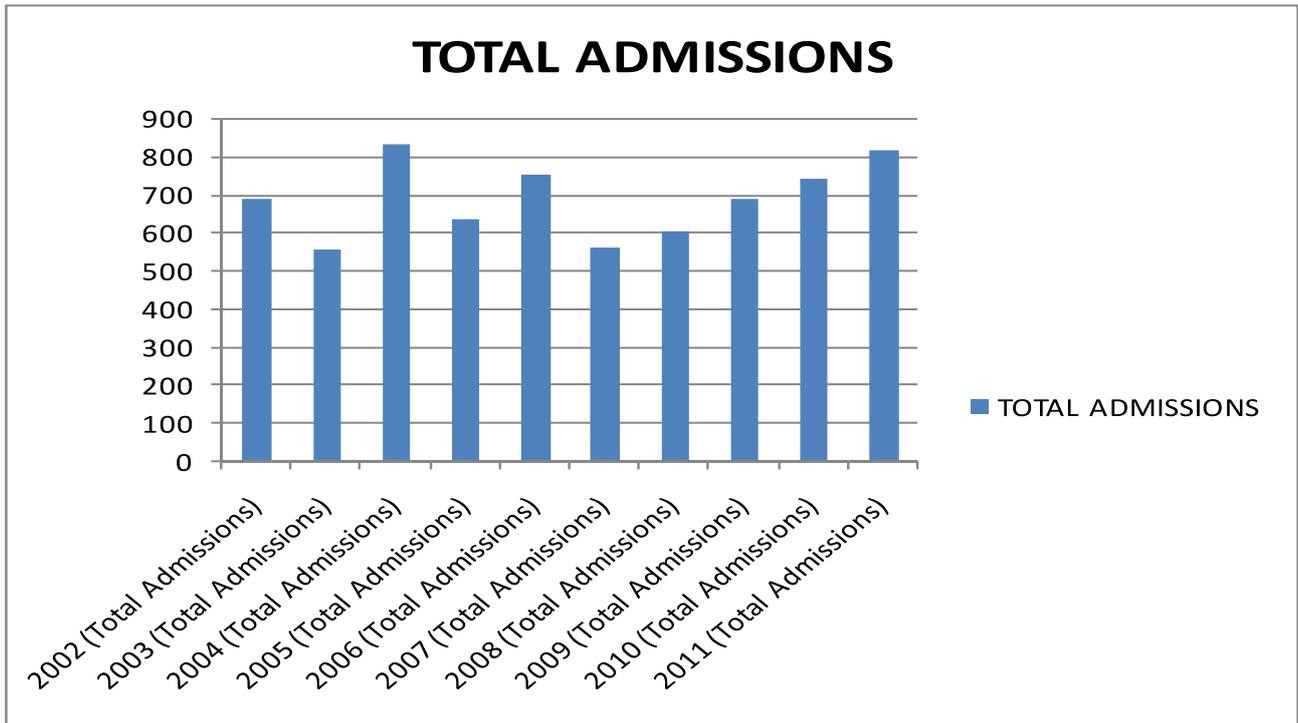


FIGURE II

TYPES OF POISONS (2002-2011)

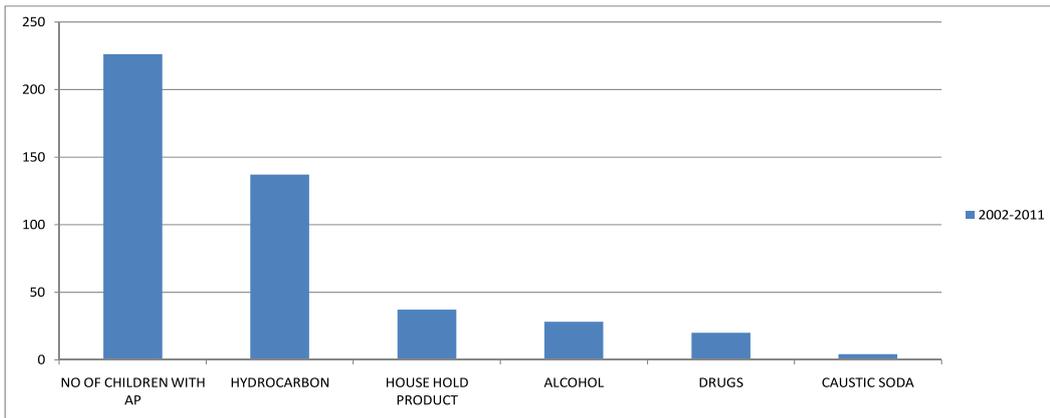


TABLE 1

CASE FATALITY ATTRIBUTABLE TO THE POISONS

POISON	CASES	DEATHS	% of Total
Kerosene	137	6	2.6
Drugs	20	4	1.8
Alcohol	28	2	0.9
Household products	37	2	0.9
Caustic soda	4	3	1.3
TOTAL	226	17	7.5

dehydration (6%). Radiological investigations in 64 children revealed bronchopneumonia (96%); pneumothorax (4%).

In the thirty seven (37) children that presented with ingestion of household products, 24 (64.9%) were asymptomatic; 8 (21.6%) had vomiting and 5 (13.5%) suffered impaired consciousness.

In the case of drugs, the children were either asymptomatic or presented with vomiting, convulsions, impaired consciousness and dehydration.

In alcohol ingestion, the children were asymptomatic and some had impaired consciousness and metabolic acidosis.

In caustic soda poisoning, the children were seen with ulcerations in the lips, tongue, drooling of saliva, vomiting and difficulty with swallowing.

Home Treatment

Information on home treatment was documented in 162 children involving administration of assorted oils such as palm, olive and palm kernel. Other

substances administered include milk, mixed magnesium trisilicate, bitter cola nut and water.

Hospital Management

Kerosene ingestion was managed with parenteral fluids and Hydrocortisone with a combination of either Ampicillin – Cloxacillin or Ceftaxidim and Gentamycin. Oxygen was administered as indicated by the clinical status.

Gastric lavage was induced in 52% children that ingested alcohol, drugs and household products. Vomiting was induced with ipecac in 6% of the children. Gastric lavage was not undertaken in the children with Kerosene ingestion.

The children with either alcohol or oral hypoglycemic agents received intravenous 50% dextrose injection followed by 10% Dextrose in water and 8% Dextrose Saline infusion.

Mortality

There were 17 deaths, amounting to an overall mortality rate of 7.5%. Caustic soda and kerosene were responsible for 50% and 33.3% of the deaths respectively. The

contributions of various poisons to mortality are shown in Table 1

DISCUSSION

Pattern and Prevalence

Accidental poisoning is responsible for 3.3% of total admissions into Modic Medical Centre. This finding is higher than the incidences of 0.5 % to 2.5% reported previously in public health institutions in Nigeria.^{3 - 6} and the explanation for the disparity is not certain but may be related to relatively easier access to obtaining care in a private health institution such as MMC, during emergency situations as in accidental ingestion of poisons. There are a lot of bureaucracies surrounding care in public health institutions particularly teaching hospitals in Nigeria leading to long waiting time.^{8,9}

Age

In this study, 97.5% of the children were aged 5 years. This finding is higher than a previous observation in Benin City⁵ that recorded a prevalence of 87%. Our finding in this study is however, in agreement with the general observation that children aged 5 years or less are particularly prone to accidental poisoning. It is also noteworthy that children 2 years (108 or 53.5%) are more likely to be poisoned accidentally when compared to those of them aged 3 - 5 years (89 or 44.1%). Similarly, the proneness to AP is higher in children aged 1 - 5 years (188 or 93.1%) when compared to those younger than 1 year and 6 years of age.¹⁰

Types of poison

The study has revealed the agents that are involved in accidental poisoning in Benin City and demonstrated that the top most agents are Hydrocarbons with other household products and alcohol. The agents involved have remained the same for the period of the study but the proportions

of the children ingesting the agents during the period of the study appear to have slightly increased from 46% in the earlier years to 54 % in the later years. The reason for this is not certain but may be attributed to increase poisoning by household products. Moreover, it could be due to the fact that parents are probably reporting cases of poisoning more frequently to the hospital. On the other hand, it may be related to the absence of care givers because of pursuit of various economic activities.

It was also notable that the proportion of poisoning by drugs has generally increased; thus suggesting a change in pattern that was reported previously in Nigeria.^{3 - 6, 11} It was important that the proportion of poisoning from caustic soda appear to be reducing and likely due to better storage in homes.

Kerosene is the foremost cause of AP, being responsible for 52.6% of cases. This result is similar to those reported from other Centers in the country^{3, 5, 6, 12} and other regions of the world such as Middle East and South Africa^{13, 14} and India.^{15, 16} Nevertheless, the finding in this study is in contrast to reports from Europe^{17, 18} and North America¹⁹ that showed drugs to be the most prevalent poisons in children.

Kerosene versus petrol

Kerosene accounted for 92.7 % of hydrocarbon while petrol was the cause in 7.3% of the children. Thus kerosene is the predominant cause of childhood poisoning in Benin City and this finding is consistent with observations of other Centers.^{3-7, 20}

Therefore, this finding is not a surprise because kerosene is readily available in every home ranking next to fire wood as major source of domestic fuel utilized for lighting and cooking.

It was also found that the product was stored in all manner of containers in the home including assorted empty soft drink bottles, cups, and empty plastic water bottles. These containers were improperly covered and it was relatively easy for the restless, impulsive and exploring children to open and gulp the contents of the containers in likely attempts to quench thirst.

Household products

The next common agents causing AP were other household products together with caustic soda and were responsible for 18.2% of the cases of childhood poisoning in Benin City. This figure is much higher than the value of 6.6% reported in a previous study in Benin City.⁵ Thus; this finding may be a reflection of increasing sophistication of our people leading to the purchase and use of the various products implicated in AP.

The range of products include bleach, cosmetic lotions for hair and body, shoe shiners, liquid soaps, floor cleaners, table salt, caustic soda and numerous unidentified products were involved in childhood poisoning. Unfortunately some of the poisons were not correctly identified because the parents and care givers failed to bring forward the containers while rushing the children to the Emergency Room in panicky and confused states.

Four children ingested caustic soda and reported late with complications. One of them died while 3 others were referred for further care in specialized centers. Two other children aged 18 months and 30 months respectively ingested large quantities of table salt. One of them was brought in dead with an empty salt container while the other died within 24 hours of hospitalization.

Alcohol

Alcohol was the next common cause of poisoning in the children. It accounted for 12.4% of the cases in this study as compared

to previously reported higher values ranging from 22% to 33% in public health institutions in Nigeria.^{3,5,20}

It was noteworthy that a locally manufactured drink called by various names such as "ogogoro", "skian", "akpetesi", was the most frequent type of alcohol ingested by the children. The product is popular among the local people and was the alcoholic drink of choice because it was relatively cheaper than other types of alcoholic drinks including beer, gin, whisky, brandy and wine. "Ogogoro" is often stored in either uncovered or improperly sealed bottles, cans and cups and so children easily mistake them for water or various soft drinks.

Drugs

The proportion of children with drug poisoning was 8.8% and was much lower than 16.9 % reported previously in Benin City.⁵ The wide disparity and lower value in this study could be the outcome of increased usage of child resistant packages and sealed envelopes for the storage of dispensed drugs.

Nonetheless, it is notable that the type and range of drugs being ingested have changed over the years. The drugs were varied and included anti-malarials, tranquilizers, antidepressants, and anti hypertensive. There was absence of agents that were frequently reported in the past. For example, no case of Acetylsalicylate (Aspirin) was recorded in this series probably due to its withdrawal from general use as anti pyretic – analgesic in children.

Metformin was ingested by 3 children and one of them, a female, presented in coma and subsequently died from intractable hypoglycaemia and lactic acidosis. The other 2 survived with no complications.

Another child, 2 year old, that ingested 8 tablets of sugar coated quinine was brought in an unconscious state and died

subsequently. Quinine tablet is shiny, whitish in colour and looks attractive and palatable. Hence, the child no doubt identified it as a harmless sweet.

Case fatality

The case fatality of 7.5% is high and significant considering that childhood poisoning is a preventable condition. Deaths from Kerosene and petrol accounted for 37.5% of fatalities and were due to massive aspiration pneumonitis resulting from attempts by parents and care givers to induce vomiting at home through the administration of palm oil leading to further complications such as lipoid pneumonitis. Household products including alcohol, caustic soda and table salt were responsible for 43.8% of the deaths that resulted from metabolic complications and structural damage like oesophageal stricture. In particular, caustic soda poisoning proved to be very deadly as it was associated with very high fatality rate because 3 out of 4 cases reported in this study died from various complications.

Two children ate large quantities of table salt and died from consequences of hypernatraemia including hyperosmolality, intracellular dehydration and intracranial hemorrhage²¹.

Fatalities from drug ingestion amounted to 23.5% of total fatalities and resulted from agents that were not reported frequently in the past in Nigeria. This may therefore signify a gradual change in the pattern of AP in Benin City, shifting towards the model in industrialized countries

CONCLUSION

Accidental childhood poisoning is still prevalent and the pattern in this study in a private hospital is similar to the situation in

public health institutions in Nigeria, and has not changed remarkably over the years. Improper handling of drugs and house hold products lead to AP. Petroleum products are the predominant cause of childhood poisoning in Benin City. However, drugs are beginning to emerge as key contributors to accidental poisoning in children.

RECOMMENDATIONS

Health education on the handling of household products and the enforcement of the use of child resistant containers and appropriate packaging for drugs are helpful. Poverty alleviation schemes to reduce wide usage of petroleum products for cooking through the introduction of cooking gas. There should be up scaling of the skills of parents and care givers in the care and handling of children through the use of information, education and communication materials in antenatal and infant welfare clinics as well as through the mass media.

LIMITATIONS TO THE STUDY

This is a retrospective study based on hospital records and so it failed to capture all the relevant data relating to AP. Moreover, the findings are not fully representative of the situation in the community because not all cases of accidental poisoning in Benin City presented to our Centre for treatment. Nonetheless, the findings of this study have provided a basis and impetus for a large scale community - based enquiry or multi - centre study of accidental poisoning in Nigerian children.

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