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Epidemiological Profile of Acute Domestic Poisoning (ADP) in Children at the Hopital Spécialisé Mère-Enfant Blanche Gomes in Brazzaville (Congo)

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Abstract

Introduction: *Domestic poisoning includes all cases of accidental or deliberate ingestion of harmful substances, with an impact of varying severity on the general condition of the child. The objective of this study is to describe the epidemiological profile of ADP in children in the pediatric department of the Hôpital Spécialisé Mère-Enfant Blanche GOMES (HSMEBG).*

Methodology: *This was a cross-sectional and descriptive study, with retrospective collection, covering the period from 2019 to 2023. The files of children aged 1 month to 17 years hospitalized at the HSMEBG for ADP were used. Epi-info 7.2.5.0 softwares was used for statistical analyses.*

Results: *Out of 5,250 new admissions, 76 cases of ADP were collected, i.e. a hospital frequency of 1.45%. The median age was 21 months (Q1=15 months, Q3=48 months). Children aged one to 5 years were the most represented (68.42%). The sex ratio was 0.77. In 40% of cases, ingestion took place at night. Ingestions were accidental in 86% of cases and voluntary, with suicidal intent in 14%. The substances ingested were petroleum (33.33%), bleach (30.67%), medicines (13.33%), detergents (8%), rat poisons (6.67%), caustic soda (4%), sewing machine lubricants (2.67%) and alkaline battery (1.33%). Symptoms on admission were: respiratory distress (25.33%), impaired consciousness (14.67%) and endo-oral burns (12.33%). Children were asymptomatic in 47.37% of cases. Chest x-ray revealed petroleum pneumonia in 23.68% of cases and digestive endoscopy showed caustic esophagitis in 8% of cases. Oxygen therapy was necessary in 35.33% of cases, antibiotic therapy in 38.67% of cases and proton pump inhibitors in 28.26% of cases. The average length of hospitalization was 2.85 days. One death (1.32%) was reported after ingestion of sewing machine lubricant.*

Conclusion: *ADPs, although relatively low in frequency, remain a real public health problem with varied consequences. In most cases they are of minor severity and do not require any treatment. Petroleum is the most ingested substance followed by caustic products. Reducing their incidence requires improving the standard of living of households.*

Keywords: Domestic Poisoning, Children, Brazzaville

Introduction

Domestic poisoning includes all cases of accidental or deliberate ingestion of harmful substances, with an impact of varying severity on the general condition of the child. Their frequency and severity vary from one country to another, but the WHO estimates 45,000 deaths per year among children and young people, linked to acute poisoning [1]. In Congo, a hospital study carried out in 2010 found a frequency of 4.7% of accidental domestic pathologies, including 64% poisoning with toxic substances [2]. Given the predominance of infectious pathologies in children in the context of Congo, public health priorities seem to minimize the impact of poisoning from domestic products, responsible for a certain morbidity.

Objectives

To study the epidemiological profile of acute domestic poisoning in children at the Hôpital Spécialisé Mère-Enfant Blanche Gomes (HSMEBG).

Methodology

This was a cross-sectional descriptive study, with retrospective data collection. The files of children from one month to 17 years old, hospitalized between 2019 and 2023 in the pediatric department of the HSMEBG, were used. Incomplete files were excluded. Socio-demographic, clinical, paraclinical and evolutionary variables were analyzed using Epi-Info version 7.2.5.0 softwares.

Results

Frequency

Among the 5,250 new admissions during the study period, 76 cases of IAD were collected, representing a hospital frequency of 1.45%.

Socio-Démographic Characteristics

The median age was 21 months and children from 13 months to 5 years were the most represented 52 (68.42%). The vast majority (82.69%) of children were not yet of school age. Other socio-demographic characteristics are reported in Table 1.

Table 1: Distribution of Children According to their Socio-Demographic Characteristics.

Socio-demographic characteristics	Number (N=76)	Proportion (%)
Age (Moy =4.11ans, med = 21mois (Q1 = 15mois, Q3=48mois) min = 1mois, max = 17ans)		
1-12months	9	11.84
13months-5years	52	68.42
6-12years	4	5.26
13-17years	11	14.47
Sex (sex-ratio = 0,77)		
Male	33	43.42
Feminine	43	56.58
School-age children		
Yes	13	17.11
No	63	82.89
Parents		
Single mothers	11	14.47
Couple parents	52	68.42
Tutors	13	17.11

Circumstances of Occurrence

The ingestion was accidental in 66 (86.84%) cases and in 10 (13.16%) cases it involved adolescents having ingested a substance with the aim of suicide.

Table 2 presents the distribution of children according to the circumstances in which the poisoning occurred.

Table 2: Distribution of Children According to the Circumstances in which the Poisoning Occurred

Circumstances of occurrence	Number (N=76)	Proportion (%)
Type of ingestion		
Accidental	66	86.84
Intentional	10	13.16
Method of ingestion		
Child himself	73	96.05
Mistake's parents	3	3.95
Time of occurrence		
Morning (7 a.m.-12 p.m.)	21	27.63
Evening (1 p.m.-6 p.m.)	23	30.26

Night (7 p.m.-6 a.m.)	32	42.11
Day of occurrence		
Weekday	52	68.42
Weekend days	24	31.58

Ingested Substances

Hydrocarbons, particularly petroleum 25 (33.33%), were the most ingested substances. They are followed by bleach 23 (30.67%) and medicines 10 (13.33%).

The substance was kept in a bottle of water or juice in 48 cases (63.15%). The distribution of substances ingested is presented in Table 3.

Table 3: Distribution of children according to integrated products

Products ingested	Number (N=76)	Proportion (%)
Hydrocarbons (n=26)		
Petroleum	25	32.89
Engine oil	1	1.32
Bleach	23	30.26
Medicines*	10	13.16
Caustic soda	3	3.95
Pesticides	3	3.95
Raticides	2	2.63
Toilet detergents	4	5.26
Others**	5	6.58

*Medicines: NSAIDs = 2, Benzodiazepines = 3, Ciproheptadine = 2, neuroleptics = 2, paracetamol = 1.

**Others: Cosmetics = 1, sewing machine lubricant = 2, sewing machine lubricant = 1, hand gel = 1.

Clinical Aspects

Children were asymptomatic in 36 (47.37%) cases. Symptoms on admission were: respiratory distress 19 (25%), impaired consciousness 11 (14.47%) and intraoral burns 10 (13.16%).

Paraclinic Aspects

Chest radiography was carried out in 32 (42.10%) children and it revealed petroleum pneumonia in 18 (23.68%) cases. Digestive endoscopy performed in 21 (28%) children showed caustic esophagitis in 6 (7.9%) cases.

Therapeutic Aspects

Twenty-five children (32.89%) were admitted to intensive care, 2 (2.63%) were intubated. Antibiotic therapy was administered to 29 (38.67%) children, with amoxicillin-clavulanic acid in 36% of cases. The other drugs used were: Omeprazole 8 (10.53%), diazepam 3 (3.95%), Flumazenil 2 (2.63%).

Evolution

The evolution was favorable, marked by discharge after 24 hours in 39 (51.32%). The average duration of hospitalization was 2.85 days with extremes of one day and 35 days. A case of esophageal stenosis was transferred to pediatric surgery. One death (1.32%) was reported after ingestion of sewing machine lubricant.

Discussion

ADPs represent a significant part of the activities in the pediatric department of the HSMEBG [1]. The frequency found in our series (1.45%) is similar to that reported by Tadmori et al in 2022 in Morocco (1.53%) [3]. Mohamed et al in Dakar, however, reported a frequency of 6% in 2019[4]. These differences can be explained by the diversity of the inclusion criteria. The estimation of the frequency of ADP varies from one study to another, depending on the methodology. Some authors study domestic accidents in general and determine the relative frequency of poisonings, others only collect typical cases of poisoning and relate them to the total number of patients [4-13].

The predominance of children under five years of age in our series is reported by most authors [2, 4–6, 14, 15]. This is explained by the fact that this is the age at which autonomy and curiosity are acquired, but also that it concerns children who are not yet in school. Children are frequently victims of poisoning, despite preventive measures taken by parents or found on the market, such as child-proof devices for medications, safe packaging of many household products as well as improved information on products that should be kept out of the reach of children.

Most accidents occurred at night (42.11%), and during weekdays. Parental fatigue after a long day at work and permanent power cuts in our context could explain these schedules. The

same observation was made in Dakar by Mohamed et al who reported 42% of domestic accidents among children between 6 and 8 p.m. When children old enough to move around find themselves outside of parental supervision, or in a dark place in the house, the curiosity to put the contents of any container into their mouths takes over.

Petroleum (32.89%) and bleach (30.26%) were the first two substances most ingested in our series. Petroleum is the hydrocarbon most present in households in Congo and is mainly used to light hurricane lamps in the event of power cuts and charcoal for cooking fires. It is often stored in old water or juice bottles. Bleach is, for its part, the most used detergent for laundry and household cleaning. It is often sold by retailers in the form of grains which users then dilute in water and keep in some container, most of the time water or juice bottles. Children automatically equate these bottles with water or juice, causing accidental ingestion. The predominance of petroleum or bleach has been reported by other authors in the African context [2, 4]. This raises the problem of improving the living conditions of households and the socio-economic level in Africa south of the Sahara. The nature of the products ingested during domestic poisonings often varies from one country to another, depending on local customs. Thus, in Morocco in 2015, Rafai et al reported a predominance of medicines and pesticides as the most ingested substances [9].

Conclusion

ADPs, although relatively low in frequency, remain a real public health problem with varied consequences. Most of the ingestions in our context took place at night and the products were in the majority of cases kept in unconventional containers. Petroleum is the most ingested substance followed by caustic products including bleach. In most cases they are not serious and do not require any treatment, but sometimes they can be serious or even fatal. Reducing their incidence requires improving the standard of living of households.

Conflict of Interest

None

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