ORIGINAL ARTICLE

Poisoning among children: an overview of the profile of poisonings in different countries

Intoxicações na infância: panorama geral do perfil das intoxicações em diferentes países

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ABSTRACT

Accidents occurring during childhood are often caused by a number of different poisoning agents. This study aimed to evaluate the profile of childhood victims of poisoning in different countries. The study included an analysis and interpretation of review articles produced between 2000-2010 available on LILACS, MEDLINE, and BDENF. The leading causes of poisoning were pesticides, pharmaceuticals, and household products. The frequency of intoxication among sexes showed more incidence among male children. Poisonings occur most frequently in the age group of up to four years. There was a high incidence of unintentional poisoning, which indicates inadequate monitoring by responsible adults and easy access to toxic substances by children. These findings can help to set guidelines for reducing morbidity and mortality rates and supporting public health policies in an attempt to prevent accidents in the home environment.

Key words: Domestic Accident; Intoxication; Child.

RESUMO

Os acidentes ocorridos na infância têm como uma de suas causas a intoxicação por série de agentes provocadores. Este estudo objetiva conhecer o perfil das crianças vítimas de intoxicações em diferentes países. Foram coletados dados com base na análise e interpretação de artigos de revisão produzidos entre os anos de 2000 e 2010 disponíveis na base de dados BVS, especificamente LILACS, MEDLINE E BDENF. Os principais agentes causadores de intoxicação eram pesticidas, produtos farmacêuticos e domésticos. A frequência da intoxicação entre os sexos mostrou mais incidência entre crianças masculinas. As intoxicações ocorrem com mais frequência na faixa etária de zero a quatro anos. Houve grande incidência de intoxicações não intencionais, o que indica vigilância inadequada pelos responsáveis e facilidade de acesso por parte das crianças ao agente tóxico. Esse conhecimento pode ajudar a definir diretrizes para a diminuição das taxas de morbimortalidade e fundamentar políticas de saúde pública para prevenção de acidentes no ambiente doméstico.

Palavras-chave*: Acidente Doméstico; Intoxicação; Criança.*

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INTRODUCTION

Accidents during childhood are currently responsible for a high number of attendances in the emergency rooms of hospitals. An accident is defined by Santos et al. [1] as a chance event, independent of human will, caused by an external force that acts quickly, manifesting itself as a body or mental injury". It is, therefore, a non-expected

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and unplanned event that shows a dysfunction of the environment where it occurs.

The non-governmental organization Safe Child [2] concludes based on data from the Ministry of Health that external causes such as intentional injuries (injuries by firearms, murder, abuse, and suicide), and unintentional injuries (traffic accidents, drowning, burns, airway obstruction, falls, poisonings, and occupational and domestic injuries) constitute the leading cause of death in Brazil among children from 1 to 14 years of age, overcoming hunger and cancer. The surprising thing is that unintentional injuries can be avoided by up to 90% of cases through a combination of factors such as education, changes in the environment, development of safer products, increased rigor in the commitment of the existing legislation and creation of specific regulations. [2] Each year, unintentional injuries in children under 14 years of age result in more than 140 thousand hospital admissions, only in the public health network, and of this total, 6 thousand children die, which configures a serious public health issue.

The Ministry of Health emphasizes that injuries resulting from external causes, also recognized as aggravations, accounted for the highest number of death in children aged 1 to 9 years of age in 2006. This serious public health problem becomes a challenge to be faced, requiring jointed efforts between government and society.

Souza et al.[3] refers to domestic accidents as intimately related to the behavior of the family and its social network, lifestyle, and educational, economic, social, and cultural factors, as well as to specific phases of childhood characterized by keen curiosity and continuous learning.

The mortality rate may vary according to the determinant cause, age group, gender, and evolution. The mortality rates reported by the DATASUS indicate that external causes provoked 13.5 deaths and 6 events of undetermined intent in every 100,000 inhabitants in 2007 in Brazil.[4]

The investigation of poisoning accidents in childhood and adolescence is considered of fundamental importance. According to Deslandes et al.[5], regardless of the terms used to name the violence against children and adolescents, it is represented in every action or omission capable of causing injuries and disorders to their full development. The accident is considered an unexpected and unplanned event that shows the dysfunction in the environment where it occurs.

For Donoso[6] the analysis of previous events involves the prevalent conditions that were enough for the occurrence of the accident. With that, one can observe everything that happens before the accident, making causal speculations.

Based on these considerations, it can be said that the domestic environment is the place where accidents occur more frequently in the early years of life because it is the environment where the child usually spends most of his time. As the child grows and develops, he acquires new skills, abilities, and interactions with the environment that increase and change according to his age.

Paes and Gaspar[7] consider that the factors that influence and favor the occurrence of accidents are related to the child himself, the environment in which he lives, and the organization of the domestic environment such as inadequate recreation, lack of vigilance, indiscipline, and inappropriate use of objects among others. According to the authors, the educational, economic, and social situations in the families can also influence the occurrence of accidents.

Many of the accidents result from poisoning by a wide variety of causing agents. The Toxic-Pharmacological National Information System (SINITOX) from Fiocruz registered more than 100 thousand cases of human poisoning and nearly 500 deaths in Brazil in 2007.[8] The data reveal that medications (30.7%), poisonous animals (20.1%), and household cleaners (11.4%) were the main causative agents of intoxications in humans on that year. The age group most hit, with about 25% of the total number of cases, was children under 5 years of age.

The poisonings have been the cause of death in children and adolescents who seek emergency care in hospitals in the large urban centers in Brazil. Soori[9] identified that 89% of intoxications cases with children took place indoors, with 79% in the age group of 0 to 4 years old and in 75% of them, the toxic chemicals were accessible.

This article seeks to learn about the profile of the child victim of poisoning in several countries.

MATERIAL AND METHODS

Articles available at the Virtual Health Library (BVS) computerized database were used in this study, specifically: Latin American and Caribbean Literature in Health Sciences (LILACS), Medical Literatu-

re Analysis and Retrieval System Online (MEDLINE), and Nursing Database (BDENF). The inclusion criterion was articles written in Portuguese and English.

The descriptors "domestic accidents" and "intoxication" were used to select articles according to the Health Sciences Descriptors (DECS). Initially, 132 articles were selected, published between 2005 and 2010. These articles addressed intoxication broadly and without the context of the theme chosen for the study, not providing enough content for the research. This led to an expansion of the search to the last 10 years and the addition of the limits "children" and "humans". A total of 52 articles were found with these parameters.

The first search contemplated "Domestic Accidents and Poisoning". From this description, 30, 95, and 7 publications were found at the LILACS, MEDLINE, and BDENF databases, respectively; however, these were not selected for reading because none contained studies involving only children.

The second search contemplated "Domestic Accidents and Poisoning" and the limits "children" and "humans". In this search, 6, 39, and 7 publications were found in LILACS, MEDLINE, and BDENF, respectively, which were selected for reading.

The abstracts of 52 selected articles were read, among which 16 were selected for an integral reading, being 3, 12, and 1 from the LILACS, MEDLINE, and BDENF databases, respectively. Thirty-six articles were excluded because they did not directly address the subject of this study.

The occurrence of a high incidence of accidents by poisoning in the childhood, especially in children under 5 years of age, and in adulthood, especially among males, was observed after the analysis of the 16 systematic review articles.

RESULTS AND DISCUSSION

Poison is a chemical substance which activity is capable of producing damage or malfunctions throughout the body. It can enter the body by multiple paths producing general or local effects (limited to the eyes, skin, lungs, etc.). All cases of poisoning resulting from accidental use of drugs and chemical substances or the use of drugs by children motivated by curiosity are referred to as accidental or unintentional poisoning. Poisoning is a qualitative term to define the potential of a chemical substance to play an adverse or deleterious activity in organisms.[11]

There are reasons to believe that the incidence of childhood poisoning accidents in developing countries should not be different from the data found in Brazil in view of the similarity of environmental factors. In Ireland, Sharif et al.[12] observed that poisoning is the leading cause of morbidity and mortality in children and adolescents, in which pharmaceuticals and household products are responsible for most cases. In this study, it was observed that out of the 32,544 recorded cases, 148 were poisoning cases, in which 86% were of accidental ingestion and 14% intentional ingestion. Out of these 148 cases, 31% showed intoxication with cleaning products, 61% with pharmaceuticals products, and 8% with alcohol.

Some authors report that the incidence of poisoning cases is higher in children under the age of 4 and 5 years old. Presgrave et al.[13] traced the profile of unintentional poisonings with cleaning products and household pesticides through a retrospective revision of medical records from two control centers in the State of Rio de Janeiro belonging to the Pharmacological National Information System (SINITOX). The study revealed that 20.9% were cases of unintentional poisoning by cleaning products; of these, 71.4% occurred in children under 5 years of age and 52.1% between 1 and 2 years of age. The proportion of female children was 57.1% above 10 years of age, and 44.5% below 10 years of age. Bleach was the most common causative agent in all ages, followed by petroleum products, pesticides, disinfectants, detergents, corrosives, and rodent poison. In all major product categories involving poisoning, more than 70% of the cases were in children under 5 years old.

The percentages related to gender in cases of poisoning vary in studies from different countries. In Nepal, Thapa et al.[11] reported the occurrence of 51.3% of cases in men and 48.6% in women, being 22.2% in the group between 11 and 20 years old and 9.4% under 10 years old in a retrospective study to determine the pattern and severity of poisoning in a hospital in Kathmandu. The authors verified that poisoning was more frequent in students, totaling 43.9% of cases. The most common causative agents were organophosphorus compounds and kerosene. Out of all poisoning records, 5.4 % occurred in children, being 9.4% in children under 10 years old.

Kouéta et al., analyzed accidental acute poisoning in children from Ouagadougou, Burkina Faso, and proved that in the age range between 6 days and 12 years old, this type of occurrence was more common

with children between 1 and 4 years old and mainly at 3 years of age,[14] with boys overcoming girls in the ratio of 1.2. The main responsible agents for intoxication were domestic products (44.7%), followed by drugs (22.7%), and food (22%). Kerosene and other oil products increased the list of domestic products to 54.5%. Tranquilizers (46.4%) and dairy products (37%) dominated in the categories of drug and food poisoning. The result was fatal in 3% of cases and 25% of all deaths resulted from drug poisoning in children between 1 and 4 years old. It is common sense that childhood poisoning accidents cause damage, many of them fatal or irreversible.

All agents mentioned before can be found at the home where the child spends most of his time and they can become causes of accidents. Lourenço et al., in descriptive study of the epidemiological characteristics of exogenous poisoning cases in children tended at a pediatric emergency unit in Recife found records in which the involvement of males (65.4% of cases) predominated in relation to females (34.6%), with children under 5 years of age (65.4%)as the most affected age group.[15] Medicines were involved in 50% of cases, followed by pesticides and insecticides (23.1%), and household cleaning products (23.1%) with more than 80% of accidents occurring in the internal area of households, mainly in the kitchen.

Chowdhury et al., conducted a study to explore the profile of morbidity and mortality by accidental poisoning among children in Sundarban, India, and found that 58% of recorded occurrences referred to male children and that organophosphates were the most common causative agent in both genders.[16] The authors emphasized the incidence of poisoning in children, in different parts of India, from 0.33 to 7.64%. The study indicated that 24% of the cases occurred through ingestion of kerosene, 9.6% of pesticides, and 8.4% of chemical products and medicines. Of these, 81% of cases were registered in the age group from 0 to 6 years old and 19% from 7 to 12 years old. Children poisoning was the 12th most common cause of hospital admissions. The authors considered the situation in developing countries alarming, mainly due to the increasing use of various agricultural chemicals.

In the USA, James et al.[17] performed a study on phenothiazine, butyrophenone, and other psychotropic substances as causes of poisoning. The authors verified that poisoning by these drugs occurred in 77.9% of cases by unintentional ingestion, distributed in 50% in each gender, in the Arkansas Children's hospital. They identified the following percentages by drug type: chlorpromazine 6.9%; thioridazine 17.4%; mesoridazine 1.2%; trifluoperazine 8.1%; perphenazine 2.3%; prochlorperazine 1.2%; flupenazina 9.3%; clorprotixene 1.2%; tiotixene 1.2%; haloperidol 40.7%; loxapine 2.3%; clozapine 2.3%; and unknown 7%. The frequency distributions by age range were: less than 6 years old, 69.7%; 6 to 12 years old, 19.8%; and more than 13 years, old 10.5%. The owners of the drugs that caused poisoning were: grandparents in 22.1% of cases; parents in 20.9%; patient in 12.8%; and non-family caregivers in 8.1%. Therefore, medications can become the cause of poisoning accidents, especially in young children.

Ramos et al.[18] identified in the Toxicological Information Center of Rio Grande do Sul that the profile of childhood poisonings in the recent decades shows medicines listed as the main cause of injuries during childhood by the world reference centers in intoxication, mostly between the ages of 0 and 4 years old.

Martins et al. reveal that poisoning accidents play an important role in the context of accidents during childhood because of their high frequency, treatment costs, possibilities of irreversible sequelae, and suffering caused to children and their families.[19] The authors believe that detailed studies can contribute to the adoption of actions to reverse the high incidence of accidents observed by means of specific measures in each stage of child development. Accidental poisoning in children stands out as a representative of the most common medical emergency with morbidity and mortality rates that are challenging global public health problems.

FINAL CONSIDERATIONS

Poisonings accidents are among cases of unintentional injuries that result in a significant number of attendances in hospitals in countries from different continents. They are significantly important due to the variety of causative factors and seriousness of cases, which may cause even death. The index of morbidity and mortality can vary according to the determinant cause, age group, gender, and evolution. Most studies refer to these data and few of them to the current situation regarding assistance, costs, and sequelae that result from the event. The results highlight the occurrence of childhood poisoning with a greater degree in children under 4 and 5 years of age and predominance of cleaning products, medicines, and pesticides as causative agents.

Considering that the life expectancy of children is greater than that of adults, an affected child may have to live with sequelae for 60 or 70 years, which causes personal, family, and social damages. This is, therefore, a serious public health problem that can be addressed by accident prevention campaigns. Some important measures to prevent poisonings may be: a) storing potentially toxic products in their original packaging, with appropriate lids, out of the reach of children, and not in contact with food; b) discarding food packaging to store cleaning products or insecticides; c) using personal protective equipment to handle chemical products and washing hands after handling; d) avoiding toxic plants at home.

Mass media campaigns could be considered to prevent poisoning accidents together with the government enforcement of laws regulating sales and disposal of solvents and pesticides.

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