

# INTOXICATION IN EARLY CHILDHOOD: DOMESTIC FIRST AID PERFORMED BY ADULTS

## INTOXICAÇÃO NA PRIMEIRA INFÂNCIA: SOCORROS DOMICILIARES REALIZADOS POR ADULTOS

## INTOXICACIÓN EL LA PRIMERA INFANCIA: SOCORROS DOMICILIARIOS REALIZADOS POR ADULTOS

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**Objective:** to identify the presence and the actions of adults in the site where toxicological accidents with children occurred and the first aids were performed. **Method:** cross-sectional study, with retrospective analysis of toxicological incidents files involving children from zero to 4 years of age, filed in a toxicological assistance center. **Results:** 1,012 files were analyzed. The profile was: male (54.9%), aged between 1 to 2 years old (64.3%) and medicines as the main agents (39.6%). Most of the accidents happened in the residence (94.8%), with children accompanied by their parents or other responsible adult. Immediately after acknowledging an intoxication episode, 229 (22.6%) adults performed first aid at home and the main actions informed were the decontamination of the affected area by flushing water and by mechanical mean (49.3%); administration of liquids for diluting the agent (32.8%); and inducing vomit/emesis (16.6%). **Conclusion:** most of first aids performed at home had no scientific evidence and were related to the family beliefs.

**Descriptors:** Child Health. Poisoning. Toxic substance. Domestic accident. Nursing care.

*Objetivo: identificar a presença e as ações de adultos no local da ocorrência de acidentes toxicológicos infantis e os primeiros socorros realizados. Método: estudo transversal, com análise retrospectiva de fichas de ocorrência toxicológica de crianças de zero a 4 anos, arquivadas em um centro de assistência toxicológica. Resultados: analisaram-se 1.012 fichas. O perfil era: sexo masculino (54,9%), com idade de 1 a 2 anos (64,3%) e medicamentos como principais agentes (39,6%). A maioria dos acidentes aconteceu na residência (94,8%), com crianças acompanhadas dos pais ou outro responsável adulto. Imediatamente após o reconhecimento do episódio de intoxicação, 229 (22,6%) adultos realizaram socorros domiciliares e as principais ações informadas foram realização de descontaminação do local afetado por lavagem e por meio mecânico (49,3%); administração de líquidos para diluição do agente (32,8%); e indução de vômito/êmesa (16,6%). Conclusão: a maioria dos socorros domiciliares realizados não teve evidência científica e estava ligada a crenças familiares.*

*Descritores: Saúde da criança. Envenenamento. Substâncias tóxicas. Acidentes domésticos. Cuidados de enfermagem.*

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*Objetivo: identificar la presencia y las acciones de adultos en el lugar de la ocurrencia de accidentes toxicológicos infantiles y los primeros auxilios realizados. Método: estudio transversal, con análisis retrospectivo de fichas de ocurrencia toxicológica de niños de cero a 4 años, archivadas en un centro de asistencia toxicológica. Resultados: se analizaron 1.012 fichas. El perfil era: sexo masculino (54,9%), con edad de 1 a 2 años (64,3%) y medicamentos como principales agentes (39,6%). La mayoría de los accidentes ocurrió en la residencia (94,8%), con niños acompañados de los padres u otro responsable adulto. Inmediatamente después del reconocimiento del episodio de intoxicación, 229 (22,6%) adultos realizaron socorros domiciliarios y las principales acciones informadas fueron la realización de descontaminación del local afectado por lavado y por medio mecánico (49,3%); administración de líquidos para dilución del agente (32,8%); y la inducción de vómito (16,6%). Conclusión: la mayoría de los socorros domiciliarios realizados no tuvieron evidencia científica y estaban vinculados a creencias familiares.*

*Descriptores: Salud del niño. Envenenamiento. Sustancias tóxicas. Accidentes domésticos. Cuidados de enfermería.*

## Introduction

In early childhood, within zero and 4 years of age, accidents increasingly have been responsible for infant injury and death in Brazil and in the world<sup>(1,2,3)</sup>. These are preventable, multicausal and complex events, and the orientation to family, caretakers and educators may avoid the majority of the incidents. When they happen in the household, they are related with the family's behavior, lifestyle, and educational, economic, social and cultural aspects; as well as to the specific growing and development phases of the child, characterized by curiosity and continuous learning<sup>(4,5)</sup>.

Among the childhood accidents, acute intoxication, characterized by the toxic effect of rapid onset and short duration, stand out as an emergent issue in the world's public health<sup>(2,3)</sup>. Poisoning represent a group of signals and toxic symptoms, or only biochemical, provoked by the interaction of a chemical agent with the biological system, thus, an organic imbalance resulting from the exposition to chemical substances, found in the environments, such as animal and plant toxins, agrochemical, medicines, industrial use products and household products<sup>(6)</sup>.

According to data released by the National System of Toxic-Pharmacological Information (Sinitox), approximately 100 thousand new cases of human poisoning were registered by the information and assistance centers in Brazil in the year of 2012. Results indicate that medications and cleaning products are the intoxicating agents, with 25% of the cases involving children under 5 years of age<sup>(7)</sup>.

Preventive behavior to poisoning is consequence of the socioeconomic and cultural

conditions, such as family beliefs. Information use level is frequently proportional to the level of the parent's instruction<sup>(8,9)</sup>. In addition to these aspects, the poisoning incidence may be explained also by aspects related to the society and State governance, such as self-medication; inadequate storage of medicines and cleaning products; parents and guardians negligence and lack of information about toxic products; difficult access to health services; indiscriminate advertisement of medicines and other toxic products; the absence of protective legislation<sup>(10)</sup>.

While family is the social unity responsible for promoting health and the well-being of its members, performing protection, security and initial care activities during life threatening and unexpected events, many domestic first-aids from family or adult caretakers in the face of domestic accidents have no scientific evidence, and in many cases, aggravate the clinical picture of the accidents<sup>(1,11)</sup>.

When the exposure to toxic agents prevention is not reached, the early and efficient treatment, after the poisoning, is the priority. Therefore, the population must be trained for effective first-aid measures in toxicological urgencies<sup>(12,13,14)</sup>. In this context, the objective of this article was to identify the presence and actions an adult performs in the site where toxicological accidents with children occurred and the first aids were performed.

## Method

This is an quantitative, exploratory descriptive study, carried out as retrospective search in epidemiological files of toxicological incidents, filed in a toxicological information and assistance center (CIAT) in northwestern Paraná,

called Poisoning Control Center in the University Hospital of Maringá (CCI/HUM), associated to the National Network of Toxicological Information and Assistance Centers.

CIAT's are specialized unities of support to toxicological urgencies and of poisoning sentinel surveillance or toxic-surveillance. Working in permanent duty regime, attending requests of information from health professionals and from the population in general, supporting diagnosis and proceedings for toxicological accidents, and developing educative actions and scientific activities in the fields of toxicology and toxinology<sup>(15)</sup>.

Studied population comprised children from zero to 4 years of age, poisoned by different toxic agents and registered to the center in the period from January, 2011 to December 2013. Poisoned children are registered in the CCI/HUM by filling out a toxicological incident report, a nationally standardized model, with the following data: identification the intoxicated child; toxicological incident information; treatment performed; clinical evolution; and the case outcome<sup>(15)</sup>. Toxicological incident report of children, which had as toxic agent venomous animals, were excluded from the study as it is understood that these accidents have very specific first aid measures, which differ from other toxic agents.

Data from the toxicological incident report, related to: children's sex and age; poisoning agent; presence of adults at the moment of the incident; first aid for poisoning measures performed by the adults; were compiled.

For data processing, an electronic databank was established using the *Microsoft Excel*® software. Results were analyzed descriptively, through absolute and relative frequency.

Research project was submitted to the Permanent Committee of Ethics in Research Involving Human Beings (Copep), at the State University of Maringá (UEM), and was approved through Decision n. 168.316/2012 and was conducted according to the required ethical standards.

## Results

In the studied period, 1,012 cases of toxicological accidents in early childhood were registered.

Most of the children were male (54.9%), and within 1 and 2 years of age (64.3%). In 91.4% of the cases, ingestion was the most expressive exposition via to the toxic agent.

In 992 toxicological incident report, in which the causal agent was specified, 10 agents were identified among the 13 established by the Sinitox. Medications were the main agent, in 40.4% of the cases, household cleaning products (19.1%) and the industrial use products, in 16.5% (Table 1).

**Table 1**—Child poisoning cases distribution, according to the toxic agent classification and circumstance, Maringá, PR, Brazil, 2011–2013. n = 1,012

Variable	n	%
Toxic agent (n = 992)		
Medicine	401	40.4
Household Cleaning Products	189	19.1
Industrial use product	163	16.5
Rodenticides	78	7.9
Agro Chemical/domestic use	45	4.5
Plant	37	3.7
Cosmetics	30	3.0
Veterinary product	21	2.1
Agro Chemical/agricultural use	15	1.5
Metal	13	1.3
Circumstance (n = 1,012)		
Individual accident	950	93.9
Administration mistake/misuse	51	5.1
Collective accident	11	1.0

Source: CCI/HUM.

Most poisonings were considered non intentional, being classified as individual accident (93.9%). Also, administration mistakes and misuse of chemical products, considering the singularity of these accidents, presented an expressive number of incidents (5.1%).

Residence was the main site of poisoning (98.2%), and in 3.5% of the cases, the child was at the house of grandparents, uncles, and other relatives or families' friends. Presence of an adult was not informed in 6.8% of the toxicological incident report, although in 92.0% of the cases there was an adult present at the moment of the incident, mainly the father and/or the mother of the children (Table 2).

**Tabela 2** – Distribuição dos casos de intoxicação infantil, segundo local do acidente e presença de adulto no momento da intoxicação, Maringá, PR, Brasil, 2011–2013. n = 1.012

Variable	n	%
Accident site (n = 1,012)		
Child's residence	959	94.7
Other*	53	5.3
Presence of an adult (n = 943)		
Yes	868	92.0
No	75	8.0
Adult present (n = 868)		
Father and/or mother	765	88.1
Grandparents	64	7.4
Uncles, cousins and babysitter	39	4.5

\* Residência de avós, tios, outros parentes e amigos, e serviço de saúde, escola ou centros de educação infantil.

Fonte: CCI/HUM.

In the face of a poisoning incident, 22.6% of the adults present at the moment of the child toxicological event performed domestic first aids. Main actions performed informed was the decontamination of the affected area by washing and mechanical mean, administration of liquid for diluting the toxic agent and inducing vomit/emesis (Table 3).

**Tabela 3** – Distribuição dos casos de intoxicação infantil, segundo socorros domiciliares e procedimentos realizados pelo adulto presente, Maringá, PR, Brasil, 2011–2013. n = 1.012

Variable	n	%
Domestic first aids (n = 1,012)		
Yes	229	22.6
No	783	77.4
Procedures (n = 229)		
Decontamination of the affected area*	113	49.3
Administration of liquid/dilution	75	32.8
Inducing vomit/emesis	38	16.6
Administration of demulcent †	3	1.3

\*Retirada do agente tóxico por lavagem e meio mecânico; † leite e azeite de oliva.

Fonte: CCI/HUM.

## Discussion

Profile and toxicological agent characteristics corroborate with national and international literature regarding to greater exposition of male children and in the early childhood to accidents and poisoning<sup>(1,16)</sup>, as in this life cycle's phase, children starts a strong interaction with the environment, through touch and taste<sup>(5,17,18)</sup>.

Also, numbers presented by Sinitox<sup>(7)</sup> for the year of 2012, indicate to the medicines and household cleaning products as the main poisoning agents in all age brackets, being 25% of the cases involving children under 5 years of age. Many medications and cleaning products have attractive and colorful packages, and which are storage in places of easy access, that may be reached by the children<sup>(9,10)</sup>.

Individual accidents are cases of poisoning or exposition of one victim only, to any chemical product or substance<sup>(19)</sup>, and this circumstance is present in the epidemiology of early childhood poisoning<sup>(9,16)</sup>. Administration mistakes, considered medication use by the patient or guardian, of inadequate dosage or via, without medical guidance or in disagreement with the prescription<sup>(19)</sup>, were made by the parents or any other guardian of the child, and depending on which via that the chemical agent was administered, could cause irreversible damages or sequelae<sup>(9)</sup>.

Although it is common sense to believe in the home as the safest place for the family to be, most of accidents involving children occurs in the residences or in its surroundings<sup>(14,20)</sup>. In popular imaginary, the residence/home is a relatively safe place, when facing the perils on the outside. Thus, the low caution can be explained by the false feeling of safety and protection<sup>(20,21)</sup>.

The house can be especially unsafe for children, as it contains objects and materials of risk in all the dependencies, such as cutting tools, furniture, windows, pans with steaming hot food, matches, medicines, detergents and other toxic products, which constitutes in special attractive for children and as younger he or she is, greater the incidence of these episodes<sup>(13,21)</sup>.

The presence of an adult did not represent a protection factor for the occurrence of the studied child poisoning, and it seemed that it did not prevent the toxicological incident to happen. Studies emphasized that in the majority of the accidents involving children, they were under the supervision of an adult<sup>(1,14,22)</sup>. However, the number of domestic first aids demonstrated low knowledge, from parents and guardians, about how to proceed immediately after a poisoning, although the guidance from the Toxicological Information and Assistance Centers is the performance of correct procedures - as inadequate procedures may aggravate the clinical picture and delay or complicate clinical evolution<sup>(13,15)</sup>.

Considering that they are always performed when the victim have no conditions of taking care of himself or herself, the first aids refer to immediate care to a person which, the physical state puts in danger their own life or health, aiming to maintain their vital functions and avoid the aggravation in their conditions, until they receive specialized medical assistance. All first aid procedures must start with an evaluation of the victim's conditions, that is essential to provide the correct assistance and can prevent more severe damage, sequelae and deaths<sup>(23,24)</sup>.

Poisoning are clinical urgencies and the main purpose of early intervention is to maintain life. CIAT's, specialized unities which have the function to provide information and guidance about diagnosis, prognosis, treatment and prevention to poisoning, and are geographically disperse throughout the country<sup>(15,25)</sup>.

If the child is unconscious and/or with cardio-respiratory difficulty, the pre-hospital care must be immediately triggered, for specialized transportation and beginning of the advanced life support procedures by the health team. If the child is conscious and alert, one must phone to CIAT (Poisoning Hotline: 0800 722 600), in order to access initial information and arrange adequate transportation to a health service. Transportation must always be done in lateral position in order to avoid aspiration of gastric content, once vomit is very frequent. Child must be kept warm during the route, as the agent's effects may not start

immediately. An important measure is to collect containers, packages and applicators involved in the poisoning, in order to show it to the health professional that will care for the child<sup>(13)</sup>.

First aid specific measures to poisoning depends mainly on the via of exposition to the toxic agent. Oral ingestion is the most expressive via of child poisoning. And the main domestic first aids recommended after the acknowledgement of the poisoning incident are: manual removal of the residues in the oral cavity; never induce vomit/emesis due to the risk of bronchoaspiration; do not offer to the child water, milk or any other liquid, as some substances are liposoluble and the liquid can accelerate the agent absorption<sup>(25,26)</sup>.

In the present study, the procedures performed in case of ingestion did not always have any scientific evidence and many were related to inadequate family beliefs. Decontamination of the affected area by washing and mechanical mean is always adequate and recommended, as it promotes the removal of the toxic agent, diminishing its absorption. However, administering liquid in order to dilute the toxic agent (indicated in specific situations only) and inducing vomit/emesis (contraindicated in all cases), contributed to the aggravation of the clinical picture<sup>(25,26)</sup>. In cases of cutaneous and ocular contact, flushing the affected area with water during 15 minutes and cover it, without pressure, with a clean cloth, were the adequate measures performed by the families<sup>(25-26)</sup>.

These results, though present as a limitation its restriction to the defined temporal outline and source, can guide those who work in direct contact with the families, as these are the protagonists in the prevention of accidents and poisoning, as well as in minimizing its consequences. We reiterate, however, that the data from the toxicological assistance and information centers are sentinels and capture social problems from the toxicological incidents, conveying greater force to the results.

## Conclusion

Associated factors to the poisoning risk in children, such as male gender, child's own space of residence and that the presence of adults did

not avoid the occurrence of the toxicological incident. Number of adults present at the moment of the accident and that performed the domestic first aids was minor, and many procedures performed had no scientific evidence and were related to inadequate family beliefs.

It is understood that is relevant to approach the theme in order to the society acknowledge the reality of toxicological accidents involving children, co-participating in the attempt to reduce domestic accident indices, which consequences can serious, with physical and emotional wounds (where some can be rehabilitated and others not), during the child's growing and development process. It is recommended that the health services work next to the community, conducting first aid training activities in the face of intoxication and poisoning accidents.

### Colaborations:

1. design, project, analysis and interpretation of data: Camila Cristiane Formaggi Sales, Patrícia Suguyama, Márcia Regina Jupi Guedes e Nataly Barbosa Alves Borghesan.

2. article writing and critical review of intellectual content: Camila Cristiane Formaggi Sales e Patrícia Suguyama.

3. final approval of the version to be published: Ieda Harumi Higarashi e Magda Lúcia Félix de Oliveira.

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