SPANISH ASSOCIATION OF PAEDIATRICS

Recommendations for the prevention of poisoning


Servicio de Urgencias de Pediatría, Hospital Universitario Cruces, Bilbao, Spain
Atención Primaria, CS Barcelona, Móstoles, Madrid, Spain
Dirección General de Tráfico, Madrid, Spain
Servicio de Pediatría, Hospital Universitario de Getafe, Madrid, Spain
Atención Primaria, Distrito Almería, Spain
Servicio de Cirugía Pediátrica, Hospital Infantil La Fe, Valencia, Spain
Servicio de Pediatría, Hospital de Son Espases, Palma de Mallorca, Baleares, Spain
Instituto de Salud Pública del Ayuntamiento de Madrid, Madrid, Spain

Received 18 December 2014; accepted 13 January 2015
Available online 4 November 2015

KEYWORDS
Childhood; Poisonings; Prevention; Paediatrics

Abstract  Poisoning is the fifth leading cause of death from unintentional injury in the WHO European region, while Spain is in the group with a lower rate. Most involuntary poisonings occur in young children in the home, due to unintentional ingestion of therapeutic drugs or household products stored in non-original containers and/or within reach of children.

In this article, the Committee on Safety and Non-Intentional Injury Prevention in Childhood of the Spanish Association of Paediatrics provides a series of legal and educational recommendations aimed at preventing such cases.

© 2014 Asociación Española de Pediatría. Published by Elsevier España, S.L.U. All rights reserved.


Corresponding author.
E-mail address: santiago.mintegi@osakidetza.net (S. Mintegi).
Members of the Committee on Safety and Prevention of Unintentional Injuries in Childhood of the Spanish Association of Paediatrics is presented in Annex I.
PALABRAS CLAVE
Infancia;
Intoxicaciones;
Prevención;
Pediatria

Introduction
Death caused by unintentional poisoning is rare, and the rate has gone down drastically in the last 50 years.\(^1\) This is mainly due to the use of medication containers and household products with child-resistant locks and the existence of safer medications. Other reasons that explain this decrease are the greater safety of consumption products, prevention regulations, public education, legal provisions, the establishment of toxicology centres, improvement in medical assistance and the availability of new antidotes.\(^2,3\)

Poisonings have more severe effects in children than in adults since they are smaller, have quicker metabolic rates and are less capable of fighting toxic chemical products.\(^4\)

Epidemiology
Poisonings constitute the fifth cause of death due to unintentional injury in the WHO European region. Every year, 3000 children under the age of 14 die of acute intoxication. Most cases are caused by exposure to toxic substances in children under the age of 5, those under the age of 2 being especially vulnerable.\(^5\) Death by poisoning in children and adolescents shows an uneven distribution in Europe, with a risk up to 40 times higher in some countries. The highest rates were observed in Lithuania, Ireland and Estonia in boys, and Romania, Latvia and Lithuania in girls. Spain is among the group of countries with a lower mortality rate.\(^5\)

More than 90% of these poisonings occur at home, and many commonly used household products may cause them, including medications, cleaning products, beauty products, alcohol, plants and pesticides.\(^5\)

In spite of the decrease in mortality, visits to the paediatric emergency departments in Spain have not decreased\(^6\) and despite the low mortality rate, morbidity and the use of health care resources including outpatient treatment, transport, tests, emergency department costs and hospital admissions, are still important factors to be considered.

Unintentional poisonings seen at the paediatric emergency departments occur mainly due to the ingestion of medications and household products, especially in the kitchen or living room. The medications most frequently involved are psychiatric drugs (particularly benzodiazepines) and paracetamol. Up to 25% of unintentional poisonings caused by household products are due to the ingestion of substances stored in non-original containers, and up to 25% of families admitted that they stored these products within the reach of children. One-third of the families contact another service before visiting the hospital, where nearly half of the children seen receive some kind of treatment and are admitted for at least a couple of hours. The performance of tests, administration of treatment and hospital admission are the most frequent actions taken in the case of medication poisonings.\(^7\)

The appearance of new products such as detergent capsules and their presentation in attractive colours have generated huge concern in the paediatric world due to the risks their ingestion generates, and this has led to calls for preventive measures affecting packaging, appearance, labelling and awareness-raising.\(^8\)

Aside from accidental consumption of toxic substances, unintentional poisonings can also be caused by errors in the administration of medications. This accounts for 6% of poisonings recorded in the Spanish paediatric emergency departments. These poisonings are due to errors in the dose calculation of medications (particularly antipyretics and antihistamines) administered to children under the age of 12 months.\(^9\)

Strategies that have proved effective in the prevention of unintentional poisoning

- The safe storage of toxic substances eliminates the risk of poisoning to a greater extent than parent supervision, and constitutes an efficient method of preventing poisoning injuries.\(^10-12\) Studies on the way in which children access toxic substances indicate that the most vulnerable moment is when the substances are being used, and that safe packaging cannot compensate on its own for unsafe storage and use. This highlights the importance of improving the safety of medication storage and the method of administration in the household. These changes must be backed by regulations and awareness-raising measures implemented both by manufacturers and local...
authors, with clear labelling (and clear administra-
tion instructions) on the container, coupled with improved  
parental supervision, child education, and advice from  
paediatricians.
- The law regarding child-proof containers reduces the  
incidence of poisoning,\textsuperscript{10,13,14} although the level of compli-
ance affects efficiency,\textsuperscript{15} and the law will be more  
effective if supported by awareness-raising activities.\textsuperscript{10}
- Toxicology centres can reduce healthcare costs consider-
able, provided the public is aware of their services.\textsuperscript{10,13}  
These institutions are only effective if parents are  
familiar with their services and know how to contact  
them. Awareness-raising activities will help to raise their  
profile.\textsuperscript{13}

Recommendations made by the Committee on  
Safety and Prevention of Unintentional  
Injuries in Childhood (Comité de Seguridad y  
Prevención de Lesiones No Intencionadas en la  
Infancia)

Almost all poisonings occur when parents or carers are at  
home but not paying attention. The most dangerous poten-
tially toxic substances found in the home are medications,  
cleaning products, antifreeze, windshield washer fluid and  
pesticides.

The following products are commonly found in the home  
and are potentially hazardous:\textsuperscript{5}
- All medications.
- Bathroom: cleaners, sprays, perfumes, colognes, hair  
sprays and mouthwashes.
- Household products: cleaners, polishers, solvents, and  
products containing bleach and acid.
- Garage or workplace: insecticides, kerosene, lighter fluid,  
turpentine, paint, glue, batteries, pneumatic fluid and  
antifreeze.
- Kitchen: detergents, bleach, softeners and pet products.
- Garden: fertilisers, pesticides, plants, mushrooms and  
berries.

Paediatricians should alert parents to the dangers  
posed by unintentional poisoning and should:
- Storage of substances\textsuperscript{5,17}:
  - Recommend storing medicines, cleaning and laundry  
    products, paints/varnishes and pesticides in their origi-
    nal containers in locked cupboards or drawers, out of  
    the sight and reach of children.
  - Emphasise dangers of storing any potentially toxic sub-
    stance in a non-original container or in a container  
    without identification and, particularly of storing it in  
    attractive-looking containers or containers that may be  
    confused with foods or drinks.
  - Emphasise the need to install automatic safety latches  
on the doors to cupboards that are within children’s  
reach and contain products that may be toxic.
- Ask parents to store remote controls, key rings, con-
gratulations cards and musical books for children in a  
safe place. These devices and others may contain small  
button batteries that can cause injury if consumed.
- Advise parents to, as far as possible, acquire containers  
with safety latches for storing medicines, and keep these  
out of the reach of children.\textsuperscript{5,17}
- Advise parents to check the label every time a medicine is  
administered to a child, so as to administer the\textsuperscript{4,17} correct  
dosage. For liquid medicines, the dispenser included with  
the medicine should be used.
- Educate parents to never refer to the medicine as  
”sweets” or give them any other attractive name.
- Insist that parents discard unused medication.
- Discourage parents from taking medication in front of the  
children.
- Recommend the purchase of household products with  
safety fasteners and close them once they are used.\textsuperscript{4,17}
- Consider the availability of a safety fastener when pre-
scribing a medication.
- Advise parents to be particularly vigilant whenever there  
is a change in routine, such as holidays, grandparents’  
visits or visits to the grandparents’ home and other special  
events.
- Find out which household products or plants are toxic. If  
unsure about a substance or plant, it should be kept out  
of children’s reach.\textsuperscript{4,17}
- Recommend keeping coal, wood or kerosene heaters in  
safe operating condition, and the same for smoke and  
carbon monoxide detectors.
- Advise parents to keep the phone number of the National  
Institute of Toxicology within easy reach.
- Advise parents to apply all these measures not only in  
their own home but also in other homes frequented by  
children, at the grandparents’ house.

National legislation
Royal Legislative Decree 1/2007 and Royal Decree 1801/2003  
make it mandatory to place safety fasteners on chemical  
product containers for the household, and not to use label  
designs that may attract children’s curiosity. They must also  
include the instructions “Keep out of children’s reach” and  
“In case of accident or danger to health, visit the doctor or  
call the National Institute of Toxicology (with the Institute’s  
phone number).”\textsuperscript{16}

There is also a specific regulation for each type of prod-
uct.
Royal Decree 3360/1983 sets out the mandatory safety  
measures in containers for products containing lye. It stipu-
lates that caps or lids must be strong and secure enough to  
withstand normal handling. They should also have a child-
proof opening device, and containers or labels with designs  
that may attract or awaken children’s curiosity are not  
authorised.\textsuperscript{16}

Royal Decree 770/1999 prohibits detergents and cleaners  
with a specific shape, smell, colour, appearance, pre-
sentation, labelling, volume or size, in order to prevent  
consumers, especially children, from confusing them with
food products and putting them in their mouth, sucking them or consuming them. It details the safety profile of and design characteristics of containers and their opening devices, in order to ensure they do not attract the attention of children or cause confusion in adult consumers. However, there is no explicit reference to the need for child-proof opening devices.  

Royal Decree 1599/1997 (amended) lists the beauty products that should include the instruction “Keep out of reach of children.”

The legislation regarding medications, formulas and official preparations establishes that a special warning must be included indicating that the medication should be kept out of reach of children (Royal Decree 175/2001: art. 6, Regulation [EC] n° 1394/2007 of the European Parliament and Council: Annex III, Royal Decree 1345/2007: Annex III.)

In spite of the legislation, several aspects could obviously be improved.

Thus, the Committee on Safety and Prevention of Unintentional Injuries in Childhood considers that the following actions should be taken to prevent unintentional poisoning:

- Increase efforts through improvement in the application of laws and, particularly, regarding the safety caps of certain cleaning products and the appearance of new detergents for washers and dishwashers. In this regard, it urges the withdrawal of products that may clearly be confused with food products, in violation of Royal Decree 770/1999, since children may put them in their mouths, suck them and consume them.
- Develop European safety measure standards for containers and closure devices particularly for medications and household cleaning products.

Conflict of interest

The authors declare that there are no conflicts of interest.

Annex I. Members of the Committee on Safety and Prevention of Unintentional Injuries in Childhood of the Spanish Association of Paediatrics:

Benitez, María Teresa, Instituto de Salud Pública del Ayuntamiento de Madrid (Institute of Public Health of the Madrid City Council), Madrid
Rubio, Bárbara, Paediatrics Department, Hospital Universitario de Getafe, Madrid
Sánchez, Francisco, Primary Care Paediatrician, District of Almeria
Vila, Juan José, Department of Paediatric Surgery, Hospital Infantil La Fe, Valencia
Yagüe, Francisca, Hospital de Son Espases de Palma de Mallorca, Baleares
Secretary: Esparza, María Jesús, Primary Care Paediatrician, CS Barcelona, Móstoles, Madrid
Co-ordinator: Mintegi, Santiago, Paediatric Emergency Department, Hospital Universitario Cruces, Bilbao

References
