



ORIGINAL ARTICLE

# Therapeutic psychotropic drugs: Most common cause of unintentional poisoning in children<sup>☆</sup>



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Received 4 December 2014; accepted 23 December 2014  
Available online 26 September 2015

## KEYWORDS

Poisoning;  
Children;  
Emergency;  
Unintentional;  
Psychotropic

## Abstract

**Introduction:** The aim of this article is to determine the most common substances involved in unintentional poisoning in children attending Pediatric Emergency Departments (PED) in Spain.  
**Methods:** A descriptive study was conducted based on a prospective registry of the poisonings registered in the 57 PED participating in the Toxicology Surveillance System of the Spanish Society of Pediatric Emergencies between October 2008 and September 2013.  
**Results:** A total of 639 poisonings were registered during the study period, 459 of them (71.8%) were unintentional. The most commonly involved substances were drugs (253, 55.1%) followed by household products (137, 29.8%). The drug groups most involved were psychotropic drugs (62, 24.5%), which included benzodiazepines (54), anti-catarrhal (41, 16.2%), and antipyretics (39, 15.4%).  
**Conclusions:** The most common reason for consulting Spanish PEDs is the unintentional ingestion of psychotropic drugs, mainly benzodiazepines.  
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## PALABRAS CLAVE

Intoxicación;  
Niño;  
Urgencias;  
No intencionada;  
Psicofármaco

## Ingesta de psicofármacos: causa más frecuente de intoxicaciones pediátricas no intencionadas en España

### Resumen

**Introducción:** El objetivo es conocer cuáles son los agentes más habitualmente implicados en las intoxicaciones medicamentosas no intencionadas que consultan en los Servicios de Urgencias Pediátricas (SUP) en España.

<sup>☆</sup> Please cite this article as: Zubiaur O, Salazar J, Azkunaga B, Mintegi S, Grupo de Trabajo de Intoxicaciones de la SEUP. Ingesta de psicofármacos: causa más frecuente de intoxicaciones pediátricas no intencionadas en España. An Pediatr (Barc). 2015;83:244–247.

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<sup>1</sup> The members of the Intoxications Working Group of the SEUP are detailed in [Appendix 1](#).

**Material y métodos:** Estudio descriptivo basado en un registro prospectivo de las intoxicaciones registradas en los 57 SUP participantes del Observatorio Toxicológico de la Sociedad Española de Urgencias de Pediatría entre octubre de 2008 y septiembre de 2013.

**Resultados:** En el periodo estudiado se registraron 639 intoxicaciones, de ellas 459 (71.8%) ingestas no intencionadas. Los agentes principales implicados fueron los fármacos (253, 55,1%), seguidos de los productos del hogar (137, 29,8%). Los grupos de fármacos más involucrados fueron los psicofármacos (62, 24,5%); de estos, 54 benzodiacepinas, anticatarrales (41, 16,2%) y antitérmicos (39, 15,4%).

**Conclusiones:** La causa más importante de consulta por una intoxicación no intencionada en la infancia en los SUP españoles es la ingesta de psicofármacos, sobre todo benzodiacepinas.

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## Introduction

Poisonings account for approximately 0.3%<sup>1</sup> of the visits to paediatric emergency departments (PEDs) in Spain, and they most frequently occur by unintentional ingestion in children less than 5 or 6 years of age.<sup>1–3</sup> This is the most common means of intoxication, far more frequent than dosing errors.

Most of these poisonings involve drugs, and paracetamol is the most frequently involved substance, accounting for nearly 20% of unintentional poisonings in children younger than 5 years in Spanish PEDs in the 2001–2002 period.<sup>3</sup> Changes in the most commonly used formulation of this drug have been associated with a decrease in the unintentional poisonings by paracetamol,<sup>1</sup> although dosing errors by parents increased at the same time.<sup>4</sup>

The aim of this study was to learn which drugs are most commonly involved in unintentional drug poisonings leading to PED visits in Spain, and to analyse the characteristics of these poisonings.

## Materials and methods

We conducted a study based in a prospective registry of the poisonings registered in the 57 Spanish PEDs that participate in the Toxicology Surveillance System of the Spanish Society of Pediatric Emergencies (Sociedad Española de Urgencias de Pediatría [SEUP]) between October 2008 and September 2013. This Surveillance System collects data on all the poisoning cases seen at participating PEDs on one day each month; the methodology of this registry has been explained in a previous article in this journal.<sup>1</sup>

The hospitals that participate in the Surveillance System are listed in [Appendix 1](#).

## Results

During the period under study, a total of 214 168 visits to the participating PEDs were documented, of which 639 (0.29%; 95% CI, 0.27–0.31%) corresponded to cases of poisoning. Of all these cases, 459 (71.8%) corresponded to unintentional

ingestions, which were most frequent in males (254; 55.3%) and children younger than 5 years (418 [91%]).

The main substances involved in unintentional poisonings by ingestion were drugs (253 [55.1%]), followed by household products (137 [29.8%]).

The most commonly involved group of drugs were psychotropic agents (62 [24.5%] of all unintentional drug poisonings); cold and cough preparations (41 [16.2%]) and antipyretics (39 [15.4%]), and benzodiazepines were the most commonly recorded psychotherapeutic drugs (54 [85.7%]) ([Table 1](#)).

Psychotropic drug poisonings, like unintentional poisonings from other drugs, occurred most frequently at the family home. However, there were some differences in these poisonings: they took place in the parents' bedroom more often (15 [25.4%] vs 16 [8.8%];  $P = .002$ ), patients were transported to the hospital in an ambulance more frequently (8 [12.9%] vs 6 [3.2%];  $P = .007$ ), and more cases presented with symptoms, especially neurologic manifestations (35 [57.4%] vs 25 [13.2%];  $P < .001$ ) and had abnormal findings in the physical examination (23 [37.1%] vs 13 [6.8%];  $P < .001$ ). Furthermore, a greater number of diagnostic tests were performed in these patients (40 [64.5%] vs 80 [42.5%];  $P = .002$ ) and a greater proportion of them were admitted to the

**Table 1** Benzodiazepines involved in unintentional psychotropic drug poisonings.

Lorazepam	13
Diazepam	8
Lormetazepam	7
Bromazepam	4
Alprazolam	4
Tetrazepam	4
Clonazepam	3
Clotiazepam	2
Citalopram	1
Midazolam	1
Zolpidem	1
Unspecified benzodiazepine	8

hospital (51 [82.2%] vs 92 [48.6%];  $P < .001$ ). The percentage of patients that sought other services before their arrival to the emergency department and the percentage that received treatment both prehospital (8%) and at the hospital (50%) were similar for all drug groups.

## Discussion

Most of the poisoning cases in children seen at Spanish PEDs are due to the unintentional ingestion of drugs by young children. Psychotropic agents are the most commonly involved substances, especially benzodiazepines, having pushed antipyretics, and paracetamol in particular, to second place along with cold and cough preparations.

As is well known, this type of poisoning occurs mostly in children less than 5 years of age,<sup>5</sup> although the shift that has been observed in the distribution of the involved pharmacological agents warrants a reflection on the finer details of how these poisonings occur. In previous case series published by the Intoxications Working Group of the SEUP, paracetamol was the main source of poisoning, involved in 20% of unintentional poisoning cases in children younger than 5 years.<sup>3</sup> Paracetamol was usually ingested when parents were not paying attention. The introduction of child-resistant closures for liquid paracetamol formulations may account for the reduction in the incidence of paracetamol poisoning. The increase in the unintentional ingestion of psychotropic drugs, which are very rarely used in young children, calls for a reflection on the accessibility to children of medications used in adults. This is a particularly worrisome issue, for while benzodiazepines are fairly safe drugs, the same cannot be said of other psychotherapeutic agents (antidepressants, antipsychotics, etc.) or other medications such as beta blockers or antihypertensives, to name a few.<sup>6</sup> Although preventive measures against these poisonings also involve family education, they are very different from those meant to avoid the accidental ingestion of paracetamol.

Psychotropic drug poisonings cause more symptoms and result in greater use of healthcare resources than other unintentional drug ingestions in terms of ambulance use, a greater number of diagnostic tests performed, and hospital admissions. Even so, the number of patients that require treatment is similar. Overall, the prognosis is favourable, but there have been fatal cases of psychotropic drug poisoning in other countries.<sup>5</sup>

In addition to educating families, joint protocols should be developed involving after-hours urgent care services, emergency departments, the Instituto Nacional de Toxicología (National Institute of Toxicology) and primary care professionals to implement early therapeutic measures whenever necessary.

Most instances of unintentional poisoning in children involve medications, and psychotropic drugs are the most frequently involved group, especially benzodiazepines. This fact must be taken into account for the development of appropriate preventive strategies.

## Conflicts of interest

The authors have no conflicts of interest to declare.

## Appendix 1. Members of the Intoxications Working Group of the SEUP.

H. Alto Deba: Itziar Iturralde; H. del Tajo, Aranjuez: Carlos García-Vao; H.U. Arnau de Vilanova, Lleida: Neus Pociello; H.U. Basurto: Javier Humayor; H. Cabueñes: Ramón Fernández; H.U. Carlos Haya: Silvia Oliva Rodríguez-Pastor; Carmen y Severo Ochoa, Cangas del Narcea: Porfirio Fernández; Complejo Hospitalario de Jaén: Tomás del Campo; C. Asistencial Universitario de León: Cristina Rodríguez; Corporación Sanitaria Parc Taulí, Sabadell: Rocío Mendivil; H.U. Cruces: June Salazar, Oihane Zubiaur, Santiago Mintegi; H.U. Doce de Octubre: Alba Palacios; H.U. Donostia: José Ángel Muñoz; H.U. Dr. Peset, Valencia: J. Rafael Bretón; H.U. Fuenlabrada: Rocío Rodríguez; Fundació Sant Hospital de la Seu d'Urgell: Jordi Fàbrega i Sabaté; H. Universitario Fundación Alcorcón: Alberto Barasoain; H. General Universitario de Alicante: Olga Gómez; H.U. Gregorio Marañón: Paula Vázquez; H. Infanta Cristina, Parla, Madrid: Andrea Mora; H. Infanta Elena, Valdemoro, Madrid: Tania Fernández; H. de Terrassa: M. José López Liñán; H. Laredo: Ana Jorda; H. Mendaro: Jesús Alustiza; H.U. Mutua Terrassa: Elena May; H.U. Niño Jesús: Juan Carlos Molina; H. Montepíncipe, H. Sanchinarro, H. Torreldones, Madrid: Silvina Natalini; H. Príncipe de Asturias, Alcalá de Henares: M. Ángeles García; H.U. Puerta de Hierro, Majadahonda: Consuelo Benito; H. Rey Juan Carlos: Pablo Bello; H.U. San Agustín: Juan Cózar; H.U. Río Hortega, Valladolid: Roberto Velasco; H. Sant Joan de Déu, Manresa: Eva Botifoll; H.U. Sant Joan de Déu: Lidia Martínez; H. Sant Joan de Reus: María Rimblas; H. San Pedro: Laura Martínez; H. Miguel Servet: Carmen Campos; H.U. Son Espases, Palma de Mallorca: Victoria López; H. Son Llàtzer: Carmen Vidal; H. Universitari Germans Trias i Pujol: Frine Brossa. H.U. Central de Asturias, Oviedo: Julián Rodríguez; H. Universitario de Salamanca: Javier López; H.U. Virgen de Las Nieves, Granada: Reyes Sánchez; H.U. Virgen de la Arrixaca: Jesús Rodríguez; H. Virgen de la Salud, Toledo: Esther Crespo; Complejo Hospitalario de Navarra: Miriam Palacios; H. Xeral de Vigo: María Tallón; H. Zumarraga: Amalia Pérez; H. La Fe: Amparo Nuño; Clínica Vistahermosa, Alicante: María de la O García; Fundación H. de Nens, Barcelona: Amalia Arce; H. Quirón, Bizkaia: Carlos Canduela; H. Clínico U. Lozano Blesa: Gonzalo González; H.U. Puerta del Mar, Cádiz: Arturo Hernández; H. Clínico U. de Valladolid: Elena Urbaneja.

Coordinator: Beatriz Azkunaga, H.U. Cruces.

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