



SCIENTIFIC LETTERS

Acute accidental poisonings related to non-original containers[☆]



Intoxicaciones agudas no intencionadas asociadas a recipientes no originales

Dear Editor:

Inappropriate habits in the storage of potentially toxic substances, such as the use of non-original containers, may facilitate unintentional acute poisonings in the paediatric age group¹ and have been associated with a potentially greater severity,² although few studies provide evidence on this subject.

The main aim of our study was to analyse whether unintentional acute paediatric poisonings by substances stored in non-original containers are more severe than the rest of poisonings. Our secondary objective was to learn the characteristics of these poisonings.

We conducted a descriptive study based on a prospective register of the cases of poisoning documented in the 59 paediatric emergency departments (PEDs) that participate in the Observatorio Toxicológico (Toxicology Surveillance System) of the Sociedad Española de Urgencias de Pediatría (Spanish Society of Paediatric Emergency Medicine) between October 2008 and September 2014. We determined severity based on diagnostic tests, the treatment received, admission to hospital or the paediatric intensive care unit, sequelae and fatalities.

The study was approved by the Committee of Ethics and Clinical Research of the Basque Country.

The participating hospitals are listed in [Appendix 1](#).

During the period under study, the 59 PEDs received 339 086 visits, of which 902 corresponded to poisonings. Out of all poisoning cases, 639 were unintended, and the type of container in which the substance was stored was documented in 611 (95.6%). In 100 of these cases (16.3%), the

toxic substance had not been stored in its original container, a circumstance that was more common in cases of poisoning with household products (57/200 [28.5%]; 95% CI, 22.2%–34.7%) than in cases of poisoning with medications (31/341 [9.0%]; 95% CI, 5.9%–12.0%). [Table 1](#) compares the characteristics of the 200 unintentional acute poisonings with household products based on the type of container used for storage.

When it came to poisoning with medications, those that involved substances stored in non-original containers corresponded more frequently to combined drug intoxications (6/31 [19.3%] compared to 13/310 [4.2%] of unintentional poisonings with medications stored in their original containers; $P < .005$), and involved psychotropic drugs more frequently (12/31 [38.7%] compared to 56/310 [18.0%]; $P < .05$), with no differences between age groups or in severity. When we analysed the data for cases in which the setting of the poisoning was documented, we found that these poisonings occurred most frequently in the parents' bedroom (8/31 [25.8%] vs 33/297 [11.1%]; $P < .05$).

The percentage of the total of unintentional acute paediatric poisonings associated with inappropriate storage was not insignificant, especially for poisonings involving household products.

In spite of preventive campaigns, up to 15% of unintentional acute poisonings result from the ingestion of products stored in non-original containers. Our study raises a red flag on the frequency of this type of poisonings, even though it is rare for them to be studied specifically.^{3,4} While there is no evidence on the impact of health education on the prognosis of acute paediatric poisonings,⁵ we believe that it is important to inform the population and paediatricians on this type of unintentional poisonings. These poisonings are particularly common in patients aged more than 4 years, in whom more than 90% of poisonings with household products are associated with inappropriate storage, especially of caustic substances. This fact may be related to the inappropriate habit of adults of storing such toxic substances in containers as common as plastic bottles, which children associate with harmless contents.

One salient finding of our study was the characteristics of medication poisonings related to inappropriate storage. The percentage of combined drug intoxications was significantly higher in these patients. The fact that such poisonings occur in the parents' bedroom and frequently

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Table 1 Characteristics of unintentional acute poisonings with household products by type of storage.

	Original container (143)	Non-original container (57)	P
<i>Age</i>			
≤4 years (181)	140; 76.9%	42; 23.0%	<.0001
>4 years (18)	3; 16.6%	15; 83.3%	
<i>Caustic ingestion</i>	26; 18.1%	25; 43.8%	<.001
<i>Diagnostic testing</i>	45; 31.5%	22; 38.6%	n.s.
<i>Treatments</i>	54; 37.8%	22; 38.6%	n.s.
<i>Admission to hospital</i>	13; 9.1%	8; 14.0%	n.s.
<i>Admission to PICU</i>	0	1; 1.8%	n.s.
<i>Sequelae</i>	0	1; 1.8%	n.s.
<i>Death</i>	0	0	n.s.

involve benzodiazepines emphasises the need to improve health education efforts in our population.

There are various limitations to our study. The prospective register did not document the type of container used by families to store the substances involved in the poisonings. This information would be helpful to design more specific preventive interventions, although its absence did not compromise the aims of the study.

While this type of storage is not associated with a potentially greater severity in poisoning cases, preventive strategies should contemplate providing health education on the storage and conservation of household products.

Appendix 1. Centres participating in and responsible for the Toxicology Surveillance System

H. Alto Deba: Agustín Rodríguez; 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; Complejo Hospitalario de Jaén: Tomás del Campo; C. Asistencial Universitario de León: Ana Gloria Andrés; Corporación Sanitaria Parc Taulí, Sabadell: Mireia Pérez; H.U. Cruces: Paula Santiago, Nerea Bilbao; H.U. Doce de Octubre: Sofía Mesa; H.U. Donostia: José Angel Muñoz Bernal; H.U. Dr. Peset. Valencia: J. Rafael Bretón Martínez; H.U. Fuenlabrada: Rocío Rodríguez; H. Francesc de Borja de Gandía: Carlos Miguel Angelats; Fundació Sant Hospital de la Seu d'Urgell: Pablo Javier Ercoli; H. Universitario Fundación Alcorcón: Alberto Barasoain; H. General Universitario de Alicante: Olga Gómez Pérez; H.U. Gregorio Marañón: Paula Vázquez; H. Infanta Cristina, Parla, Madrid: Begoña de Miguel; H. de Terrassa: Judit Barrena; H. Laredo: Ana Jorda; H.U. Lucus Augusti: Sandra Yáñez; H. Mendaro: Laura Herrero; H.U. Mutua Terrassa: Elena May Llanas; H.U. Niño Jesús: Juan Carlos Molina; H. Materno-infantil de Las Palmas de Gran Canaria: Lily Mangione; H. Materno-infantil de Badajoz: Paz Hurtado; H. Ntra. Sra. de Sonsoles, Ávila: Helvia Benito; H. Montepríncipe, H. Sanchinarro, H. Torrelodones, Madrid: Silvina Natalini; H. Príncipe de Asturias, Alcalá de Henares: M. Angeles García Herrero; H.U. Puerta de Hierro Majadahonda: Consuelo Benito Caldés; H. Rey

Juan Carlos: Pablo Bello Gutiérrez; H.U. San Agustín: Juan Cózar Olmo; H.U. Río Hortega, Valladolid: Roberto Velasco; H. Sant Joan de Déu, Xarxa Hospitalaria i Universitaria de Manresa. Fundació Althaia: Eva Botifoll García; H.U. Sant Joan de Déu: Lidia Martínez Sánchez; H. Sant Joan de Reus: María Rimblas; H. San Pedro: Laura Martínez; H. Miguel Servet: Carmen Campos Calleja; H.U. Son Espases, Palma de Mallorca: Victoria López Corominas; H. Son Llàtzer: Carmen Vidal Palacios; H.U. Central de Asturias, Oviedo: Julián Rodríguez; H. Universitario de Salamanca: Javier López Ávila; H.U. Virgen de la Arrixaca: Carlos Pérez; H. Virgen de la Salud, Toledo: Esther Crespo Rupérez; Complejo Hospitalario de Navarra: Miriam Palacios; H. Zumarraga: Amalia Pérez; Fundación H. de Nens, Barcelona: Amalia Arce Casas; H. Quirón, Bizkaia: Itziar Iturralde; H. Clínico U. Lozano Blesa: Gonzalo González García; H.U. Puerta del Mar, Cadiz: Arturo Hernández; H. Clínico U. de Valladolid: Elena Urbaneja Rodríguez; Complejo Asistencial de Segovia: H. General: Rebeca Garrote; H.U. y Politécnico La Fe de Valencia: Rafael Señor; Hospital de Mataró: Joaquim Martorell Aymerich; H.U. Marqués de Valdecilla: José Lorenzo Guerra; H. Sierrallana: José Lorenzo Guerra; H. Gernika-Lumo: Alicia Gutiérrez.

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Overgrowth syndromes and development of embryonic tumours: A review of cases in the last 5 years[☆]



Síndromes de sobrecrecimiento y desarrollo de tumores embrionarios: revisión de nuestra casuística en los últimos 5 años

Dear Editor:

Overgrowth syndromes (OSs) comprehend a heterogeneous group of diseases characterised by the presence of global or localised overgrowth that is usually associated with intellectual disability, specific craniofacial anomalies or congenital defects and increased risk of developing embryonic tumours. The revolutionary introduction of next-generation sequencing technology leading to the discovery of new genes and the delineation of new clinical spectra has allowed us to classify this group of diseases into three broad categories¹: constitutional single-gene disorders due to germline mutations in a specific gene (Sotos, Weaver, Simpson–Golabi–Behmel, Bannayan–Riley–Ruvalcaba, Perlman syndrome etc.), somatic gene disorders (macrocephaly-capillary malformation, CLOVE syndrome, CLAPO syndrome, etc.) and syndromes secondary to dysregulation of imprinted genes (Beckwith–Wiedemann syndrome [BWS], isolated hemihyperplasia [IH], etc.). On the other hand, several chromosomal disorders² have been associated with overgrowth in childhood (Klinefelter syndrome, deletion 2p23.3q24.3, deletion 22q13qter, etc.).

In our region, BWS and Sotos syndrome are the most frequent of these diseases, with an estimated incidence of 1/13,700 and 1/15,000 to 1/20,000 inhabitants, respectively. Both are associated with an increased risk of developing tumours, most commonly neural crest tumours, haematologic malignancies and sacrococcygeal teratomas in Sotos syndrome, and Wilms tumour and hepatoblastoma in BWS and IH.^{1,3} At present, there is no specific protocol for the followup of Sotos syndrome, but follow-up protocols for BWS and IH have been established. Although there is still some debate around it, it is recommended that

abdominal ultrasound scans are performed every three to six months until age 7–8 years and measurement of serum alpha-fetoprotein every three months until age 4 years.^{4–6}

We describe the reason for referral, molecular testing and presence or absence of embryonic tumours in 76 patients aged less than 18 years referred in the past five years to the clinical genetics department for suspected OS. Of the total of 76 patients, 72% were referred for suspected BWS/IH (38) or Sotos syndrome (17); the most frequent clinical manifestations in the first group were macroglossia, omphalocele, hemihyperplasia and overgrowth, and in the second group, macrocephaly, overgrowth and psychomotor delay. Other reasons for referral were suspicion of Costello syndrome (9), Weaver syndrome (5), macrocephaly-capillary malformation (5), Simpson–Golabi–Behmel syndrome (3) and nonspecific overgrowth (6). The patients underwent the following genetic tests (positives/total): karyotyping or CGH array (4/45 [9%]: one Pallister–Killian syndrome, one Klinefelter syndrome, one 46,XX male with positive *SRY*, one mosaic trisomy 22 in a patient with IH [skin biopsy]); MS-MLPA region 11p15.5 (11/43 [25%]: 10 BWS and 1 IH); MLPA region 5q35 (0/35 [0%]); *NSD1* gene sequencing (1/6 [16%], one Sotos syndrome); sequencing of other genes including *GPC3* (0/3 [0%]), *HRAS* (4/8 [50%]: 4 Costello syndrome); *EZH2* (1/4 [25%]: one Weaver syndrome); *PTEN* (2/5 [40%]: one Bannayan–Riley–Ruvalcaba syndrome, one macrocephaly-autism syndrome). Overall, out of a total of 41 cases with a specific diagnosis (54%), the diagnosis was confirmed by genetic testing in 23 (30%). The most frequent diagnoses were IH (12) and BWS (10); macrocephaly-capillary malformation (6); Costello syndrome (4); chromosomal disorder (3); Sotos syndrome (2); Weaver syndrome (2); Bannayan–Riley–Ruvalcaba syndrome (1), and macrocephaly-autism syndrome (1). The rest were classified as nonspecific overgrowth of unknown aetiology or seemingly isolated defects (omphalocele, macroglossia, etc.) (Table 1).

A comparison of the indications for referral (72% for suspected BWS/IH or Sotos syndrome) with the specific diagnoses made in our population (57%) evinces the complexity of these disorders and the overlap in their clinical manifestations, as well as the importance of the assessment by a clinical geneticist for their adequate characterisation.

None of the patients with BWS (10) due to IC2 hypomethylation in the 11p15 region or with Sotos syndrome (2) developed tumours during followup. The mean duration of followup was three years, which may have biased the results. One in twelve (8.3%) patients with IH and an unknown genetic defect developed paravertebral neuroblastoma at 16 months, which supports the recommendation

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