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Clinical Profile and Advanced Treatment Requirements in Children Admitted to the Pediatric Intensive Care Unit for Accidental Poisoning

Çocuk Yoğun Bakım Ünitesine Yatırılan Kazara Zehirlenme Olgularında Klinik Profil ve İleri Tedavi Gereksinimi

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Abstract

Objective: To describe the clinical profile, exposure patterns, treatments, and need for advanced pediatric intensive care unit (PICU)-level therapy among children admitted for accidental poisoning.

Method: This single-center, retrospective, descriptive study included children aged ≥1 month and <13 years who were admitted to the PICU for accidental poisoning between January 1, 2021, and January 31, 2026. Demographic characteristics, exposure agents and mechanisms, clinical findings, treatments, PICU length of stay, and hospital outcomes were obtained from electronic medical records. Severe clinical toxicity was defined as age-specific hypotension, a Glasgow Coma scale score of 8 or lower, clinically significant arrhythmia, seizure, or cardiac arrest. Invasive or non-invasive ventilation, vasopressor/inotropic support, continuous renal replacement therapy, therapeutic plasma exchange, extracorporeal membrane oxygenation, or hemoperfusion were considered advanced PICU-level therapies.

Results: Fifty-four patients were included. The median age was 29 months (interquartile range, 22-39.75), and 57.4% were male. Most exposures occurred at home (88.9%), resulted from exploratory ingestion (90.7%), and involved a single substance or product (98.1%). Medications were the most common exposure category (70.4%). Eighteen patients (33.3%) were symptomatic. Severe clinical toxicity occurred in three patients (5.6%), and five (9.3%) required advanced PICU-level therapy. Three patients received invasive

Öz

Amaç: Kazara zehirlenme nedeniyle çocuk yoğun bakım ünitesine (ÇYBÜ) yatırılan çocukların klinik özelliklerini, maruziyet örüntülerini, uygulanan tedavileri ve ÇYBÜ düzeyinde ileri tedavi gereksinimlerini değerlendirmek amaçlandı.

Yöntem: Bu tek merkezli, retrospektif ve tanımlayıcı çalışmaya, 1 Ocak 2021-31 Ocak 2026 tarihleri arasında kazara zehirlenme nedeniyle ÇYBÜ'ye yatırılan ≥1 ay ve <13 yaş arasındaki çocuklar dahil edildi. Demografik özellikler, maruziyet etkenleri ve mekanizmaları, klinik bulgular, tedaviler, ÇYBÜ yatış süresi ve hastane sonlanımları elektronik tıbbi kayıtlardan elde edildi. Ciddi klinik toksisite; yaşa göre hipotansiyon, Glasgow Koma skalası skorunun 8 veya altında olması, klinik olarak anlamlı aritmi, nöbet veya kardiyak arrest olarak tanımlandı. İnvaziv veya non-invaziv ventilasyon, vazopressör/inotrop desteği, sürekli renal replasman tedavisi, terapötik plazma değişimi, ekstrakorporeal membran oksijenasyonu veya hemoperfüzyon ileri ÇYBÜ tedavisi olarak kabul edildi.

Bulgular: Çalışmaya 54 hasta dahil edildi. Medyan yaş 29 ay (çeyrekler arası aralık, 22-39,75) ve hastaların %57,4'ü erkekti. Maruziyetlerin %88,9'u evde, %90,7'si keşif amaçlı kazara alım sonucunda gerçekleşti ve %98,1'i tek bir madde veya ürüne maruziyet şeklindeydi. İlaçlar en sık maruziyet grubuydu (%70,4). On sekiz hasta (%33,3) semptomatikti. Ciddi klinik toksisite üç hastada (%5,6), ileri ÇYBÜ tedavisi gereksinimi beş hastada (%9,3) saptandı. Üç hastaya invaziv mekanik ventilasyon, bir hastaya non-invaziv ventilasyon, üç hastaya vazopressör/inotrop desteği, iki hastaya sürekli renal

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Abstract

mechanical ventilation, one received non-invasive ventilation, three received vasopressor/inotropic support, two underwent continuous renal replacement therapy, and two underwent therapeutic plasma exchange. The median PICU length of stay was 2 days, and all patients survived to hospital discharge.

Conclusion: Accidental poisonings predominantly occurred in young children, at home, and after single-agent exposure. Although advanced therapy was required infrequently, selected patients needed complex intensive care support. These findings emphasize the importance of safe storage practices and standardized triage approaches for determining the appropriate level of care.

Keywords: Accidental poisoning, advanced therapy, pediatric intensive care, pediatric toxicology, triage

Öz

replasman tedavisi ve iki hastaya terapötik plazma değişimi uygulandı. Medyan ÇYBÜ yatış süresi 2 gündü ve tüm hastalar sağ olarak taburcu edildi.

Sonuç: Kazara zehirlenmeler çoğunlukla küçük çocuklarda, ev ortamında ve tek ajan maruziyeti şeklinde gerçekleşmiştir. İleri tedavi gereksinimi düşük olmakla birlikte, seçilmiş hastalarda kompleks yoğun bakım desteği gerekmiştir. Bulgular, güvenli saklama önlemlerinin ve uygun bakım düzeyini belirleyecek standart triyaj yaklaşımlarının önemini göstermektedir.

Anahtar kelimeler: Çocuk yoğun bakım, ileri tedavi, kazara zehirlenme, pediyatrik toksikoloji, triyaj

Introduction

Accidental poisoning occurs most commonly in early childhood and typically takes place in the home. Young children are particularly vulnerable because of their natural tendency to explore their surroundings and place unfamiliar substances in their mouths. Medications and household chemicals are among the leading causes, although cleaning products, hydrocarbons, pesticides, rodenticides, and plant-derived products may also be involved (1,2). A substantial proportion of accidental exposures may be prevented through safe storage practices, appropriate medication dosing, and caregiver education (1,3).

Although most pediatric poisonings are asymptomatic or cause only mild clinical manifestations, some patients may develop altered mental status, respiratory depression, seizures, cardiac arrhythmias, or hemodynamic instability. These patients may require admission to the pediatric intensive care unit (PICU) for close monitoring, antidotal therapy, or respiratory and hemodynamic support (4). However, not every child admitted to the PICU requires an intensive care-level intervention. Some are admitted because of the characteristics of the ingested substance, the potential for delayed toxicity, or the need for close observation (4,5).

Previous studies have shown that many children admitted to the PICU after poisoning do not ultimately require PICU-level interventions (5,6). However, data comprehensively evaluating exposure characteristics, mechanisms of accidental poisoning, treatments administered, and the need for PICU-level support remain limited.

This study aimed to describe the demographic and clinical characteristics, exposure patterns, mechanisms of accidental poisoning, treatments administered, and short-term outcomes of children admitted to the PICU for accidental poisoning. As a secondary objective, we evaluated the proportion and clinical characteristics of patients who developed severe clinical toxicity or required advanced PICU-level therapy.

Materials and Methods

Study Design and Patient Population

This single-center, retrospective, descriptive study was conducted in the PICU of University of Health Sciences Turkey, Sancaktepe Şehit Prof. Dr. İlhan Varank Training and Research Hospital. The electronic medical records of children aged 1 month to 12 years who were admitted to the PICU for accidental poisoning between January 1, 2021, and January 31, 2026, were reviewed retrospectively. Accidental poisoning was defined as unintentional exposure to medications, pesticides or rodenticides, chemical substances, or plant-derived products. Patients with intentional ingestions were excluded.

The study was approved by the Clinical Research Ethics Committee of University of Health Sciences Turkey, Sancaktepe Şehit Prof. Dr. İlhan Varank Training and Research Hospital (decision no: 2026/114, date: 25.02.2026). The requirement for informed consent was waived by the ethics committee because of the retrospective study design. The study was conducted in accordance with the ethical principles of the Declaration of Helsinki.

During the study period, there was no standardized PICU admission protocol specifically for poisoning cases. Decisions regarding PICU admission were based on the patient's clinical condition, the characteristics of the exposure, the potential risk of delayed toxicity, the need for monitoring, recommendations from the National Poison

Consultation Center (114) when deemed necessary, and the judgment of the attending clinician.

Data Collection and Classification

Data extracted from the medical records included age, sex, body weight, history of regular medication use, Pediatric Risk of Mortality III (PRISM III) score (7), location of exposure, number of agents involved, availability of an estimated dose, mechanism of accidental exposure, clinical findings at presentation, treatments administered, PICU length of stay, and hospital outcome.

Exposures were classified into four main categories: medications, pesticides/rodenticides, chemical products, and plant-derived products. Medications were further categorized according to their pharmacological class as antipsychotics, analgesics/antipyretics, cardiovascular agents, colchicine, non-steroidal anti-inflammatory drugs, antidepressants, antiepileptic drugs, anticoagulants, benzodiazepines, antihistamines, and iron preparations. Chemical products were classified as alcohol-containing products, corrosive or cleaning agents, and hydrocarbons or organic solvents, whereas plant-derived products were categorized as toxic plants and volatile or essential oils.

For tabulation, multiple-agent exposure was defined as exposure to more than one separate substance or product. A cardiovascular combination preparation was categorized as a single cardiovascular agent exposure, although its active components were described in the Supplementary Table 1 when clinically relevant.

The mechanism of accidental exposure was classified into two categories. Unsupervised access to and ingestion of a substance present in the child's environment was defined as exploratory accidental ingestion, whereas administration of the wrong medication or an incorrect dose by a caregiver was classified as a caregiver-related medication or dosing error.

Patients were considered symptomatic at presentation if at least one exposure-related clinical finding was documented. The assessed findings included altered level of consciousness, somnolence, vomiting, age-specific hypotension, seizures, clinically significant arrhythmias, and other neurological symptoms. Because symptom data were obtained retrospectively from medical records, they were not documented in a standardized manner for all patients.

Severe Clinical Toxicity and Advanced PICU-level Therapy

For the purposes of this study, severe clinical toxicity was defined as the presence of at least one of the following: Age-specific hypotension, a Glasgow Coma scale score of 8 or lower, clinically significant arrhythmia, seizure, or cardiac arrest. Hypotension was assessed according to age-specific lower limits for systolic blood pressure.

The need for advanced PICU-level therapy was defined as the use of at least one of the following interventions: invasive mechanical ventilation, non-invasive ventilation, vasopressor or inotropic support, continuous renal replacement therapy (CRRT), therapeutic plasma exchange (TPE), extracorporeal membrane oxygenation, or hemoperfusion.

Because the mode of antidote administration—single dose, repeated dosing, or continuous infusion—could not be reliably distinguished in all cases, antidote use was not included in the definition of advanced PICU-level therapy. Intravenous lipid emulsion was recorded separately as a toxicology-specific rescue therapy and was not used as an independent criterion for advanced PICU-level therapy.

Treatments and Outcomes

Recorded treatments included activated charcoal, gastric lavage, antidotes, intravenous lipid emulsion, invasive and non-invasive respiratory support, vasopressor or inotropic

Table 1. Demographic and exposure characteristics of the study population

Age, months, median (IQR)	29 (22-39.75)
Male sex, n (%)	31 (57.4)
Body weight, kg, median (IQR)	15.0 (12.0-17.75)
PRISM III score, median (IQR)	0 (0-0)
History of regular medication use, n (%)	6 (11.1)
Location of exposure, n (%)	
Home	48 (88.9)
Outdoor setting	5 (9.3)
Another household	1 (1.9)
Number of agents involved, n (%)	
Single-agent exposure	53 (98.1)
Multiple-agent exposure	1 (1.9)
Estimated ingested dose known, n (%)	14 (25.9)
Mechanism of unintentional exposure, n (%)	
Exploratory ingestion by the child	49 (90.7)
Caregiver-related dosing error	5 (9.3)

Data are presented as n (%) or median (interquartile range), unless otherwise indicated. PRISM III: Pediatric Risk of Mortality III, IQR: Interquartile range

therapy, CRRT, and TPE. The antidotes administered were N-acetylcysteine, vitamin K, and ethanol.

The descriptive outcomes included the distribution of exposure agents and mechanisms, clinical characteristics at presentation, treatments administered, PICU length of stay, and hospital outcomes. The secondary outcomes were severe clinical toxicity and the need for advanced PICU-level therapy.

Statistical Analysis

Statistical analyses were performed using IBM SPSS Statistics for Windows, version 26.0 (IBM Corp., Armonk, NY, USA). The distribution of continuous variables was assessed using the Shapiro-Wilk test and visual inspection. Continuous variables with non-normal distributions were presented as medians with interquartile ranges (IQRs), while categorical variables were summarized as numbers and percentages. Because of the small number of patients with severe clinical toxicity or requiring advanced PICU-level therapy, no comparative inferential analyses or multivariable modeling were performed for these groups. Patients who received advanced therapy were therefore described individually according to their clinical characteristics.

Results

A total of 54 children admitted to the PICU for accidental poisoning were included in the study. The median age was 29 months (IQR, 22-39.75), the median body weight was 15.0 kg (IQR, 12.0-17.75), and the median PRISM III score was 0 (IQR, 0-0). Thirty-one patients (57.4%) were male, and six (11.1%) had a history of regular medication use.

Most exposures occurred at home (n=48, 88.9%), while five (9.3%) occurred outdoors and one (1.9%) in another household. Fifty-three patients (98.1%) had a single-agent exposure, whereas one patient (1.9%) was exposed to two agents. The estimated dose was known in 14 cases (25.9%). The mechanism of exposure was classified as exploratory accidental ingestion in 49 patients (90.7%) and caregiver-related medication or dosing error in five (9.3%) (Table 1).

Medications were the most common exposure category, accounting for 38 cases (70.4%). Antipsychotics and analgesics/antipyretics were each involved in eight patients (14.8%), followed by cardiovascular agents in five (9.3%), colchicine in four (7.4%), and non-steroidal anti-inflammatory drugs and antidepressants in three patients each (5.6%). Antiepileptic drugs were involved in two patients (3.7%), while anticoagulants, benzodiazepines, antihistamines, iron preparations, and salicylate plus an angiotensin-converting enzyme inhibitor were each involved in one patient (1.9%).

Pesticide or rodenticide exposures occurred in nine patients (16.7%), chemical product exposures in five (9.3%), and plant-derived product exposures in two (3.7%). Within the pesticide/rodenticide group, eight patients had been exposed to rodenticides with an unknown active ingredient, and one to an agricultural pesticide. Among chemical exposures, alcohol-containing products were the most common subgroup, affecting three patients (5.6%) (Table 2).

At presentation, 18 patients (33.3%) were symptomatic. The most frequently documented findings were altered level of consciousness, defined as a Glasgow Coma scale score below 15 (n=14, 25.9%), somnolence (n=9, 16.7%), and vomiting (n=8, 14.8%). Age-specific hypotension was present in three patients (5.6%), while no seizures or clinically significant arrhythmias were observed. Three patients had agitation,

Table 2. Distribution of exposure categories and toxic agents

Medications, n (%)	38 (70.4)
Antipsychotics	8 (14.8)
Analgesics/antipyretics	8 (14.8)
Cardiovascular agents	5 (9.3)
Antigout agents (colchicine)	4 (7.4)
Non-steroidal anti-inflammatory drugs	3 (5.6)
Antidepressants	3 (5.6)
Antiepileptic drugs	2 (3.7)
Anticoagulants	1 (1.9)
Benzodiazepines	1 (1.9)
Antihistamines	1 (1.9)
Vitamin/mineral preparation (iron)	1 (1.9)
Salicylate plus an angiotensin-converting enzyme inhibitor*	1 (1.9)
Pesticides/rodenticides, n (%)	9 (16.7)
Rodenticide, active ingredient unknown	8 (14.8)
Agricultural pesticide, active ingredient unknown	1 (1.9)
Chemical products, n (%)	5 (9.3)
Alcohol-containing products	3 (5.6)
Corrosive/household cleaning product	1 (1.9)
Hydrocarbon/organic solvent	1 (1.9)
Plant-derived products, n (%)	2 (3.7)
Cardiotoxic plant (oleander)	1 (1.9)
Essential oil (eucalyptus oil)	1 (1.9)

*: This patient represented the only multiple-agent exposure and was exposed to both a salicylate and an angiotensin-converting enzyme inhibitor; the patient was counted once as a combined exposure subgroup

numbness, or other neurological symptoms recorded in free-text form. Clinical findings overlapped, and the categories of altered level of consciousness and somnolence included some of the same patients.

Activated charcoal was administered to 41 patients (75.9%), and gastric lavage to 28 (51.9%). Eleven patients (20.4%) received an antidote, while five (9.3%) required advanced PICU-level therapy. Forty patients (74.1%) received neither an antidote nor advanced PICU-level therapy, and two received both.

Severe clinical toxicity was identified in three patients (5.6%). All three had age-specific hypotension, and one patient with olanzapine exposure also had a Glasgow Coma scale score of 8. No seizures, clinically significant arrhythmias, or cardiac arrests occurred. Invasive mechanical ventilation was provided to three patients, non-invasive ventilation to one, and vasopressor or inotropic support to three. One patient received intravenous lipid emulsion, two underwent CRRT, and two underwent TPE (Table 3).

The median PICU length of stay was 2 days (IQR, 2-3; range, 1-16 days). All patients survived to hospital discharge.

The five patients who required advanced PICU-level therapy were 16-84 months of age (Supplementary Table 1). The patient exposed to methylated spirits received ethanol, invasive mechanical ventilation, vasopressor support, and CRRT; the indication for CRRT was severe metabolic acidosis and hemodynamic instability. The patient with olanzapine exposure required invasive mechanical ventilation because of depressed consciousness with a Glasgow Coma scale score of 8 and received vasopressor support for age-specific hypotension. The patient exposed to an agricultural pesticide with an unidentified active ingredient received invasive mechanical ventilation because of a decreased level of consciousness. In the patient exposed to a cardiovascular combination preparation containing a calcium channel blocker and an angiotensin-converting enzyme inhibitor, severe hemodynamic instability was managed with non-invasive ventilation, vasopressor support, intravenous lipid emulsion, CRRT, and TPE. The patient with paracetamol exposure underwent TPE because of hepatotoxicity and coagulopathy. PICU length of stay among these five patients ranged from 4 to 16 days.

Discussion

In this study, most children admitted to the PICU for accidental poisoning were of preschool age, and exposures occurred predominantly at home and involved a single agent. Medications were the most common exposure category. By contrast, severe clinical toxicity and the need for advanced PICU-level therapy were observed in only a small proportion of patients, and all survived to hospital discharge. These findings suggest that, although most accidental poisonings in children follow a

Table 3. Clinical presentation, management, and short-term outcomes

Variable	Value
Clinical presentation	
Symptomatic at presentation, n (%)	18 (33.3)
Altered level of consciousness (GCS <15), n (%)	14 (25.9)
Somnolence, n (%)	9 (16.7)
Vomiting, n (%)	8 (14.8)
Age-specific hypotension, n (%)	3 (5.6)
Seizure, n (%)	0 (0.0)
Clinically significant arrhythmia, n (%)	0 (0.0)
Other neurological symptoms, n (%)	3 (5.6)
Gastrointestinal decontamination and antidotal therapy	
Activated charcoal administration, n (%)	41 (75.9)
Gastric lavage, n (%)	28 (51.9)
Any antidote administered, n (%)	11 (20.4)
N-acetylcysteine, n	9
Vitamin K, n	1
Ethanol, n	1
Severe toxicity and advanced PICU-level therapy	
Severe clinical toxicity, n (%)	3 (5.6)
Advanced PICU-level therapy, n (%)	5 (9.3)
Invasive mechanical ventilation, n (%)	3 (5.6)
Non-invasive ventilation, n (%)	1 (1.9)
Vasopressor/inotropic support, n (%)	3 (5.6)
Intravenous lipid emulsion, n (%)	1 (1.9)
Continuous renal replacement therapy, n (%)	2 (3.7)
Therapeutic plasma exchange, n (%)	2 (3.7)
Short-term outcomes	
PICU length of stay, days, median (IQR)	2 (2-3)
PICU length of stay, range, days	1-16
Discharged alive, n (%)	54 (100.0)
In-hospital mortality, n (%)	0 (0.0)

Clinical findings were not mutually exclusive. Severe clinical toxicity was defined as age-specific hypotension, Glasgow Coma scale score ≤8, clinically significant arrhythmia, seizure or cardiac arrest. Advanced PICU-level therapy included invasive or non-invasive ventilation, vasopressor/inotropic support, continuous renal replacement therapy, therapeutic plasma exchange, extracorporeal membrane oxygenation, or hemoperfusion. Intravenous lipid emulsion was recorded separately as a toxicology-specific rescue therapy. GCS: Glasgow Coma scale, IQR: Interquartile range, PICU: Pediatric intensive care unit

relatively mild clinical course, selected patients may still require mechanical ventilation, vasopressor support, or extracorporeal therapies.

The median age of 29 months and the predominance of exploratory accidental ingestion in our cohort are consistent with previous studies showing that unintentional poisonings occur most frequently in early childhood (8,9).

In the series by Olguin et al. (8), which focused on unintentional medication poisonings, the median age was similarly 2 years, and most patients were younger than 5 years. This age-related predominance may reflect young children's tendency to explore their surroundings orally and their unsupervised access to potentially toxic substances (8). By restricting our cohort to children aged ≥1 month and <13 years with accidental exposures, we reduced the clinical and behavioral heterogeneity associated with intentional ingestions during adolescence.

The predominance of home-based exposures in our cohort (88.9%) is consistent with previous reports emphasizing the importance of access to toxic substances within the household in childhood accidental poisoning (2). Medications were the leading exposure category, accounting for 70.4% of cases, which is also in keeping with the medication-focused series reported by Olguin et al. (8). Differences in the distribution of medication classes across studies may reflect variations in study period, prescribing and medication-use patterns, and the restriction of our cohort to patients admitted to the PICU. However, given the small number of patients within individual exposure subgroups, no reliable association can be drawn between specific drug classes and a severe clinical course.

It is noteworthy that activated charcoal and gastric lavage were used frequently, even though only one-third of the patients were symptomatic at presentation. Current toxicology practice favors an individualized approach to gastrointestinal decontamination rather than its routine use, taking into account the ingested substance, estimated dose, formulation characteristics, time elapsed since exposure, and airway protection (10,11). Gastric lavage should therefore be reserved for highly selected situations in which the potential benefits are judged to outweigh the risks (11,12). The relatively high utilization rates observed in our cohort may reflect several factors, including local practice patterns, uncertainty regarding the amount ingested, concern about delayed or initially occult toxicity, and a precautionary approach in young children whose clinical assessment may be challenging. Some decontamination procedures may also have been initiated in the referring emergency department or another healthcare facility before admission to the PICU. However, the retrospective records did not consistently include the time elapsed since ingestion, the location at which the procedure was performed, the clinical rationale, or the estimated severity of the exposure. We were therefore unable to determine whether activated charcoal or gastric lavage was administered within an appropriate time window or according to a clearly documented toxicological indication. These findings should not be interpreted as demonstrating inappropriate treatment in individual patients; rather, they highlight the need for more consistent documentation and for locally standardized, indication-based gastrointestinal decontamination protocols aligned with contemporary toxicology recommendations.

The low proportion of patients requiring advanced PICU-level therapy (9.3%) suggests a potential discrepancy between PICU admission after acute poisoning and the subsequent need for intensive care interventions. Similarly, in the large cohort reported by Patel et al. (5), only approximately one in six children admitted to the PICU received a PICU-level intervention. Their age-specific models, based on clinical effects and selected exposure types, identified low-risk patients with a negative predictive value of approximately 95%. In the model's independent validation cohort, PICU admissions were projected to decrease by approximately one-third (5). In a subsequent prospective evaluation, the simplified clinical decision tool also demonstrated high sensitivity for identifying children at very low risk of clinically significant poisoning (6). The low rate of advanced PICU-level therapy observed in our smaller cohort, which was limited to accidental exposures, is broadly consistent with these findings. However, because time to presentation, detailed organ system findings, and local admission criteria could not be fully evaluated retrospectively, this similarity is insufficient to support the direct application of a triage model.

However, the low intervention rate should not be interpreted as evidence that these admissions were unnecessary. Defining intensive care solely in terms of invasive procedures or pharmacologic interventions may fail to capture other important components of care, including close monitoring and the early detection of clinical deterioration. Bateman (13) likewise noted that low intervention rates may reflect the scope of the intervention definition rather than inappropriate PICU admission. Accordingly, the main value of our findings lies not in

retrospectively classifying admissions as necessary or unnecessary, but in describing the clinical characteristics of patients who required advanced therapy and generating hypotheses for standardized triage approaches to be evaluated prospectively (5,6).

The diversity of causative agents among the five patients who required advanced therapy indicates that severe clinical deterioration was not confined to a single exposure category. The use of mechanical ventilation, vasopressor support, intravenous lipid emulsion, CRRT, and TPE exchange in these cases further illustrates that selected accidental poisonings may be associated with complex intensive care needs. Nevertheless, the fact that all patients survived to hospital discharge and that the median PICU length of stay was short suggests a favorable short-term prognosis in this cohort. However, the absence of mortality may reflect the small sample size, the restriction of the study to accidental exposures, and the limited number of high-risk toxic agents. These findings should therefore not be generalized to all pediatric poisoning cases.

Study Limitations

This study has several limitations. Its single-center, retrospective design introduces the possibility of inaccuracies related to the quality and completeness of medical records. Because the estimated dose was available for only approximately one-quarter of the patients, dose-response relationships could not be evaluated. Symptoms and clinical findings were not documented in a standardized manner across all cases, which may have resulted in misclassification or underreporting of symptom patterns. The time from exposure to presentation, the timing of decontamination, and the detailed rationale for PICU admission were not consistently recorded.

The absence of standardized, poisoning-specific PICU admission criteria represents an important source of selection bias. Admission decisions were influenced not only by the child's clinical condition, but also by the perceived toxicity of the agent, concern about delayed deterioration, the need for close monitoring, and individual clinician judgment. As a result, the study population may include both children admitted because of established clinical severity and clinically stable children admitted primarily as a precaution. Conversely, children with similar exposures who were managed in the emergency department or pediatric ward were not captured. Therefore, the observed rates of severe toxicity and advanced PICU-level therapy should be interpreted within the context of local admission practices and may not reflect the full spectrum of accidental poisoning in children.

Because the mode of antidote administration could not be reliably distinguished, antidote use was not included in the definition of advanced PICU-level therapy. The small number of patients with severe toxicity or requiring advanced therapy precluded comparative analyses.

Conclusion

Most children admitted to the PICU for accidental poisoning were young, had been exposed at home, and had single-agent exposures, with medications representing the most common causative category. Severe clinical toxicity and the need for advanced PICU-level therapy occurred in only a small proportion of patients, and all survived to hospital discharge. These findings reinforce the importance of safe storage practices in the home and highlight the need to review gastrointestinal decontamination practices and develop standardized triage approaches to identify the appropriate level of care for low-risk patients. However, given the retrospective design, no individual admission can be classified as unnecessary.

Ethics

Ethics Committee Approval: The study was approved by the Clinical Research Ethics Committee of University of Health Sciences Turkey, Sancaktepe Şehit Prof. Dr. İlhan Varank Training and Research Hospital (decision no: 2026/114, date: 25.02.2026).

Informed Consent: The requirement for informed consent was waived by the ethics committee because of the retrospective study design.

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For transparency, the authors note that an artificial intelligence-assisted language model (ChatGPT, OpenAI) was utilized to support language correction. This assistance was limited to linguistic refinement; all scientific content, critical analysis, and final editorial decisions were made exclusively by the authors.

Footnotes

Authorship Contributions

Surgical and Medical Practices: K.B.G., E.G.Ş., İ.A.Y., F.V., C.D., Concept: K.B.G., F.V., C.D., Design: K.B.G., F.V., C.D., Data Collection or Processing: K.B.G., E.G.Ş., İ.A.Y., Analysis or Interpretation: K.B.G., F.V., C.D., Literature Search: K.B.G., E.G.Ş., İ.A.Y., Writing: K.B.G., E.G.Ş., İ.A.Y., F.V., C.D.

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Supplementary Table Link: https://d2v96fxpocvxx.cloudfront.net/a426c3a3-a110-40af-a6dd-1b2b563ce9ac/content-images/346500ca-2933-4d7d-bb34-fbefdbfd9cc9.pdf

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