



Assessment of Acute Poisoning Cases Admitted to the Pediatric Intensive Care Unit: A Tertiary Hospital Experience

Çocuk Yoğun Bakım Ünitesine Yatırılan Akut Entoksikasyon Olgularının Değerlendirilmesi: Bir Üçüncü Basamak Hastane Deneyimi

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Abstract

Introduction: Pediatric intoxications are frequently encountered in emergency departments and pediatric intensive care units and may lead to significant morbidity and mortality. This study aims to evaluate the etiological factors, clinical characteristics, treatment approaches, and outcomes of acute intoxication cases admitted to the pediatric intensive care unit of a tertiary care center and to describe the regional intoxication profile.

Methods: This retrospective study included 391 children hospitalized with acute intoxication in the Pediatric Intensive Care Unit of Bolu Abant İzzet Baysal University Faculty of Medicine between 2012 and 2018. Demographic variables, type and intent of intoxication, route of exposure, time to presentation, clinical findings, treatments, length of stay, and outcomes were collected from hospital information systems and medical records. Statistical analyses were performed using IBM SPSS v22 with a significance level of $p < 0.05$.

Results: The mean age was 7.9 ± 6 years; 52.4% were younger than five years, 39.6% were adolescents, and 62.4% were female. Most intoxications occurred at home (89%) and were accidental (66.4%), while intentional ingestions were significantly more common among adolescents and females ($p < 0.001$). A seasonal increase was noted in summer. Oral ingestion was the predominant exposure route, and medications accounted for 70.8% of toxic agents, especially analgesics and central nervous system drugs. Rodenticide exposure was more frequent in younger children. Many patients were asymptomatic at presentation; hydration (60.6%), gastric lavage, and activated charcoal (58.8%) were the most common treatments. Antidotes, mechanical ventilation, and hyperbaric oxygen therapy were required in selected cases. The mean pediatric intensive care unit stay was 1.6 ± 1.1 days, and the mortality rate was 0.5%.

Öz

Giriş: Çocukluk çağı entoksikasyonları, acil servis ve çocuk yoğun bakım ünitelerinde sık karşılaşılan, morbidite ve mortalite açısından önemli sonuçlar doğurabilen klinik tablolardır. Bu çalışma, üçüncü basamak bir merkezde çocuk yoğun bakım ünitesine yatırılan akut entoksikasyon olgularının etkenlerini, klinik özelliklerini, uygulanan tedavi yaklaşımlarını ve sonuçlarını değerlendirerek bölgesel entoksikasyon profilini ortaya koymayı amaçlamaktadır.

Yöntemler: Bu geriye dönük çalışma, 2012-2018 yılları arasında Bolu Abant İzzet Baysal Üniversitesi Tıp Fakültesi, Çocuk Yoğun Bakım Ünitesi'ne akut entoksikasyon tanısıyla yatırılan 391 olguyu içermektedir. Demografik özellikler, zehirlenme nedeni ve şekli, maruziyet yolu, başvuru zamanı, klinik ve fizik muayene bulguları, tedavi yaklaşımları, yatış süreleri ve sonuçlar hastane bilgi yönetim sistemi ve arşiv dosyalarından elde edilmiştir. Veriler IBM SPSS v22 programı ile analiz edilmiş, uygun istatistiksel testler kullanılmış ve $p < 0,05$ anlamlı kabul edilmiştir.

Bulgular: Olguların yaş ortalaması $7,9 \pm 6$ yıl olup, %52,4'ü beş yaşından küçük, %39,6'sı ergen yaş grubundaydı; %62,4'ü kızdı. Zehirlenmelerin çoğu ev ortamında (%89) ve kazara (%66,4) gelişirken, özkıym amaçlı entoksikasyonlar belirgin olarak adolesanlarda ve kızlarda daha sık izlendi ($p < 0,001$). Mevsimsel değerlendirmede yaz aylarında başvuruların arttığı saptandı. En sık maruziyet yolu oral alım olup, toksik etkenlerin %70,8'ini ilaçlar oluşturdu; analjezikler ve santral sinir sistemi ilaçları başlıca sorumlu gruplardı. Rodentisit maruziyeti özellikle küçük yaş grubunda dikkat çekiciydi. Olguların önemli bir kısmı başvuruda asemptomatik olup, başvuru sonrası en sık uygulanan tedaviler hidrasyon (%60,6), gastrik lavaj ve aktif kömürdü (%58,8); seçilmiş olgularda antidot, mekanik ventilasyon ve hiperbarik oksijen tedavisi uygulandı. Ortalama yoğun bakım yatış süresi $1,6 \pm 1,1$ gün, mortalite oranı ise %0,5 olarak bulundu.

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Abstract

Conclusion: Accidental intoxications predominated in young children, whereas intentional ingestions were more common among adolescents. Medications were the leading toxic agents. Early recognition, appropriate decontamination, and intensive care support contributed to the low mortality. Strengthening family education, ensuring safe storage of toxic substances, regulating rodenticide use, and implementing preventive mental health programs for adolescents may help reduce pediatric intoxications.

Keywords: Child, acute intoxication, poisoning, pediatric intensive care, drug poisoning, intentional drug ingestion

Öz

Sonuç: Bulgular, çocukluk çağında kazara, ergenlerde ise özkiyim amaçlı entoksikasyonların öne çıktığını ve ilaçların temel toksik ajanı oluşturduğunu göstermektedir. Erken başvuru, uygun dekontaminasyon ve yoğun bakım desteği ile mortalitenin düşük tutulabileceği görülmektedir. Bölgesel veriler, aile eğitimi, güvenli ilaç ve toksik madde saklanması, rodentisit kullanımının kontrolü ve ergen ruh sağlığına yönelik koruyucu programların güçlendirilmesi gereğini vurgulamaktadır.

Anahtar Kelimeler: Çocuk, akut entoksikasyon, zehirlenme, çocuk yoğun bakım, ilaç zehirlenmesi, özkiyim amaçlı ilaç alımı

Introduction

Acute poisonings account for a significant proportion of pediatric emergency department visits and intensive care admissions. Particularly during early childhood, developmental curiosity, exploratory behavior, and easy access to household toxic substances place this age group at higher risk. According to the 2023 report of the National Poison Data System (NPDS) in the United States, 39.6% of reported cases involved children under five years of age.¹ In Türkiye, data from the National Poison Control Center for 2020 show that 25.1% of reported cases also involved this age group.² Data from the Turkish Statistical Institute also reveal that external causes and poisonings are the most frequently identified causes of death among children aged 1-17.³ These findings demonstrate that poisonings in childhood are not only common but also represent a clinical condition requiring attention due to their potential consequences.

The substances causing poisoning and the mode of exposure may vary according to age, sex, educational level, and socioeconomic characteristics. These variables can directly influence the clinical manifestations, morbidity, and mortality rates of poisoning cases. Therefore, every country requires centers equipped to manage poisoning cases.⁴ Additionally, the mode of ingestion of toxic substances varies with age; accidental ingestion is more common in childhood, while intentional exposure is reported to be more prevalent in the adolescent age group.⁵

The aim of this study was to evaluate the etiological distribution, clinical characteristics, and outcomes of pediatric acute poisoning cases requiring intensive care, thereby establishing a regional profile and contributing to preventive strategies.

Materials and Methods

This retrospective study was conducted from 2012 to 2018 in the six-bed tertiary pediatric intensive care unit of the Bolu Abant İzzet Baysal University Faculty of Medicine. The unit

did not have a pediatric intensive care specialist, and patient management was carried out by a pediatrician. The attending physician had experience in pediatric intensive care, and the patient's diagnosis, treatment, and follow-up were conducted in accordance with the current guidelines.

The study included patients aged 1 month to 18 years who were admitted to the pediatric intensive care unit with a diagnosis of acute poisoning during the specified period. Patients with incomplete records, those under 1 month of age, and those over 18 years of age were excluded from the study.

Patient data were obtained from the hospital information management system and from archived records. Demographic characteristics (age, sex), presentation locations (city center, district, referral from neighboring provinces), the causative agent of poisoning, the mode of poisoning (accident/suicide), time of presentation (month, season), time of poisoning, environment of exposure to the toxic substance, time elapsed since exposure (<1 hour, 1-6 hours, >6 hours), clinical findings, laboratory results, treatments administered, and clinical outcomes were recorded. Age groups were defined according to the developmental stage classification commonly used in pediatric clinics: 1 month-5 years as the "early childhood period", 6-11 years as the "school-age period", and 12-18 years as the "adolescent period".

The times of poisoning onset were recorded and categorized into the intervals 06:00-12:00 and 18:00-06:00 to establish clinically meaningful periods. The relationship between the onset times, age groups, and intoxication type (accidental or suicidal) was statistically analyzed.

The treatments administered included supportive care (hydration), gastric lavage, activated charcoal administration, antidote therapy, mechanical ventilation, and inotropic support. Initial evaluation and treatment of the patients were performed in the emergency department, and those requiring intensive care were admitted to the pediatric intensive care unit for monitoring. Emergency department management

and intensive care unit management were analyzed together. Clinical outcomes were recorded as length of stay in the intensive care unit, discharge, transfer, and mortality.

Ethics Approval

Approval for the study was obtained from the Bolu Abant İzzet Baysal University Clinical Research Ethics Committee (approval no: 2018/204, date: 13.12.2018).

Statistical Analysis

IBM SPSS Statistics v22.0 was used for data analysis. Continuous variables were assessed for normality using the Kolmogorov-Smirnov test. Variables with a normal distribution were presented as mean $\pm$ standard deviation, while those without a normal distribution were presented as median (minimum-maximum). Categorical variables were expressed as frequencies (n) and percentages (%). For comparisons between groups, the chi-square test or Fisher's exact test was used; for continuous data, the independent-samples t-test or the Mann-Whitney U test was used. A p-value of <0.05 was considered statistically significant.

Results

A total of 391 patients admitted to the pediatric intensive care unit during the study period were included in the analysis. Mean age of the patients was 7.9 ± 6.0 years, with ages ranging from 2 months to 17 years. Of the patients, 147 (37.6%) were male and 244 (62.4%) were female. When the distribution by age group was examined, 1.8% of cases were in the 2-12-month age group, 50.6% in the 1-5-year age group, 7.9% in the 6-11-year age group, and 39.6% in the 12-18-year age group.

When the settings in which poisonings occurred were evaluated, 89% of cases occurred in the home. Less frequently, cases were reported at school (0.7%), in a neighbor's home (2%), on the street (1.7%), and in other settings (6.3%).

When the distribution of cases by season was examined, 24.3% occurred in the spring, 27.1% in the summer, 26.6% in the fall, and 22% in the winter. In terms of geographic distribution, 55.5% of patients were referred from the central district of Bolu, 25.6% from surrounding districts, and 18.9% from neighboring provinces.

When the causes of poisoning were evaluated, it was determined that 66.4% of cases were accidental, while 33.5% were intentional (suicide). When the age group distribution was examined, accidental poisonings were significantly higher in children, whereas suicide-related poisonings were significantly more common among adolescents [6.8% (n=9) versus 88.4% (n=227) and 11.6% (n=30) versus 93.2% (n=125); $p<0.001$].

When the relationship between gender and type of poisoning was evaluated, accidental exposures were more common among males, while suicide-related poisonings were significantly higher among females [accidental: males 50.4% (n=131) vs. females 12.2% (n=16); suicide-related: females 87.8% (n=115) vs. males 49.6% (n=125); $p<0.001$].

When methods for detecting poisoning were examined, it was determined that the diagnosis was made in 20.2% of cases at the onset of symptoms, in 18.4% of cases upon noticing medication left out in the open, in 24.8% of cases while the medication was being ingested, and in 23.5% of cases when the patient reported the ingestion of the toxin. In the remaining 13% of cases, a diagnosis of intoxication was made based on clinical and laboratory findings in patients presenting for other reasons.

Evaluation of the clinical findings at presentation (Table 1) showed that 66.8% of patients were asymptomatic. The most common complaints among symptomatic patients were nausea and vomiting, accounting for 14.3%.

The distribution of intoxicating agents is shown in a donut chart in Figure 1. Evaluation of the causes of poisoning showed that drug-related exposures constituted the largest group (70.8%).

When drug groups were examined, central nervous system-acting drugs accounted for 41.5% (n=115), analgesics for 40.4% (n=112), antihypertensives for 8.3% (n=23), gastrointestinal system medications for 2.1% (n=6), antibiotics for 2.1% (n=6), antihistamines for 2.1% (n=6), iron preparations for 0.7% (n=2), and other agents for 2.5% (n=7). When individual drugs were evaluated, paracetamol was found to be the most common causative agent (21.2%) (Figure 2).

When drug-induced poisonings were evaluated, 75% of cases involved a single-drug, while 25% involved ingestion of multiple drugs. When analyzed by gender, single-drug poisonings were more common in male patients, whereas multiple-drug poisonings were significantly more frequent in female patients [10.1% (n=7) vs. 41.8% (n=87) and 58.1%

Table 1. Distribution of clinical symptoms at presentation

Clinical symptom	Number of cases (n)	Percentage (%)
Asymptomatic	261	66.8
Nausea-vomiting	56	14.3
Abdominal pain	6	1.5
Drowsiness	30	7.7
Loss of consciousness	23	5.9
Agitation	14	3.6
Convulsion	1	0.3
Total	391	100.0

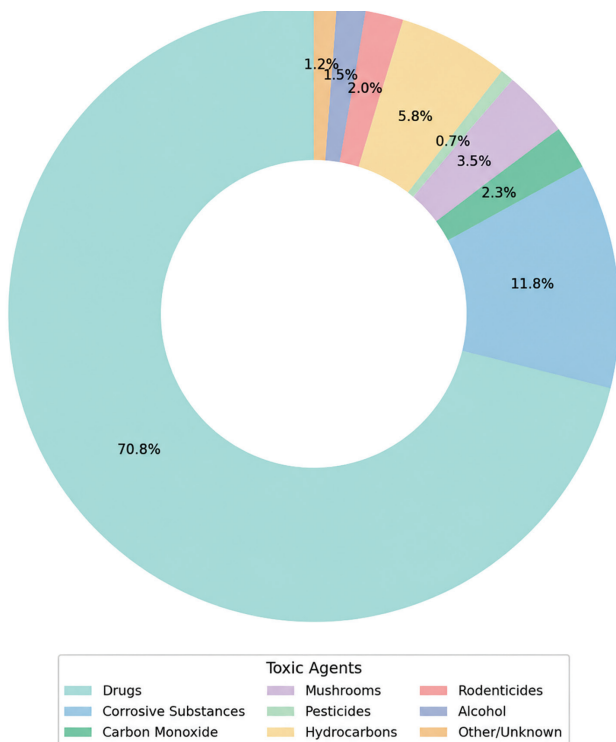


Figure 1. Distribution of toxic agents

(n=121) vs. 89.8% (n=62), $p<0.001$]. When evaluated by age group, single-drug ingestion-related intoxications were more prevalent in childhood, whereas multiple-drug ingestion was significantly higher in adolescents [60.8% (n=124) vs. 25% (n=17), and 39.2% (n=80) vs. 75% (n=51), $p<0.001$].

The timing of intoxications varied by age group. In pediatric patients, exposure to toxins occurred more frequently between 06:00-12:00, whereas in adolescents it predominated during the 18:00-06:00 time window [54.7% (n=81) vs. 74.4%

(n=61); 25.6% (n=21) vs. 45.3% (n=67), $p=0.011$]. When the relationship between the type of poisoning and the time of occurrence was examined, accidental poisonings occurred more frequently between 6:00-12:00 PM, whereas suicide-related poisonings were significantly more common during the 6:00 PM-6:00 AM window [60.3% (n=88) vs. 83.1% (n=69) and 16.9% (n=14) vs. 39.7% (n=58), $p=0.001$].

Physical examination findings at presentation are summarized in Table 2. Upon evaluation, no pathological physical examination findings were observed in 76.2% of the patients at the time of presentation.

When emergency department presentation times were analyzed by age group, the majority of pediatric patients presented within the first hour after poisoning, whereas adolescents presented more frequently after the first 6 hours [42.3% (n=11) vs. 68.8% (n=163) and 31.2% (n=74) vs. 57.7% (n=15), $p<0.001$].

When time to presentation was evaluated by type of poisoning, most patients with accidental poisoning reached a healthcare facility within the first hour, whereas presentations for poisonings with suicidal intent were more common in the 1-6-hour window [57.7% (n=56) versus 73.6% (n=176) and 26.3% (n=63) vs. 42.3% (n=41), $p=0.009$] (Table 3).

It was determined that the mean age of the patients diagnosed with drug-induced intoxication was statistically significantly higher compared to patients exposed to rodenticides (rat poison) (8.9 ± 6.2 years vs. 3.8 ± 4.1 years, $p=0.003$). No significant association was observed between age and other toxic agents ($p>0.05$).

The distribution of treatment approaches is shown in Figure 3. When treatment methods were examined, the most frequently used interventions were hydration (60.6%) and gastric lavage combined with activated charcoal (58.8%).

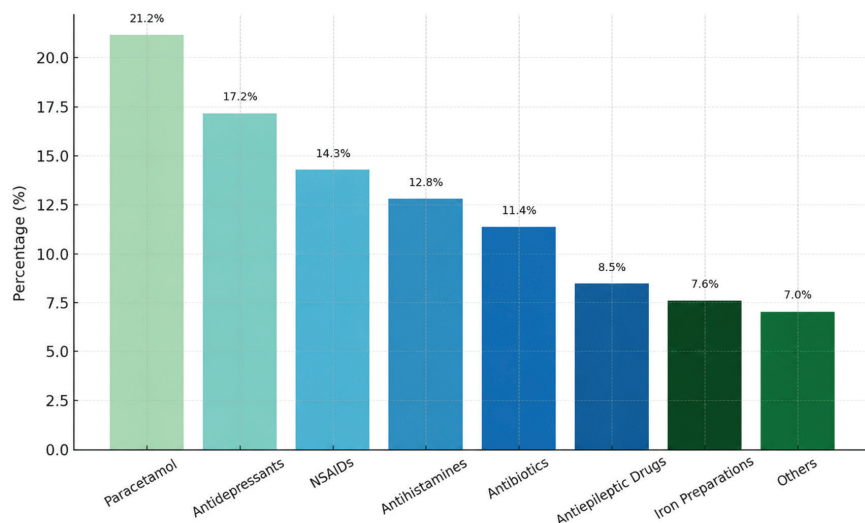


Figure 2. Distribution of drug classes causing poisoning

Table 2. Distribution of physical examination findings at presentation

Physical examination finding	Number of cases (n)	Percentage (%)
No pathological findings	298	76.2
Dyspnea	9	2.3
Tachypnea	8	2.0
Tachycardia	60	15.3
Hypertension	8	2.0
Skin hyperemia	3	0.8
Oral mucosal burn	2	0.5
Miosis	2	0.5
Mydriasis	1	0.3
Total	391	100.0

The average hospital stay was 1.6 ± 1.1 days, ranging from 1 to 15 days. When the intensive care unit length of stay was evaluated by sex, it was found to be 1.6 ± 1.5 days for male patients and 1.6 ± 0.8 days for female patients, and no statistically significant difference was detected between the groups ($p=0.12$).

The vast majority of patients in the study group were discharged (97.7%; $n=382$). Seven patients (1.8%) were transferred to another center to receive hyperbaric oxygen therapy, and two

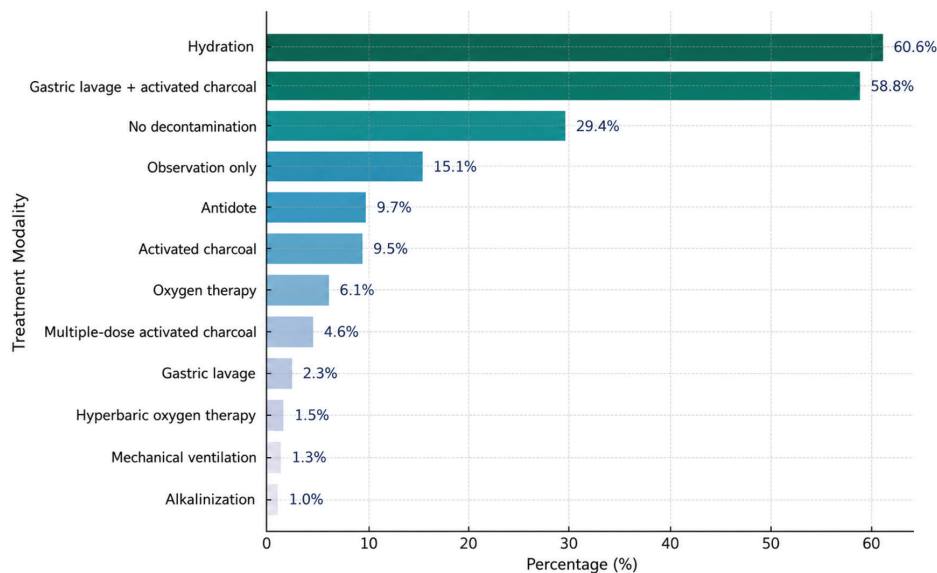
patients (0.5%) died. One patient died from carbon monoxide (CO) poisoning, while the other died from complications following administration of high-dose intravenous diazepam after an epileptic seizure in a neighboring province.

Discussion

Acute poisonings in children rank among the preventable causes of morbidity both globally and in our country. When examining health issues related to traumatic and external causes in Türkiye, it is reported that poisonings rank fourth after traffic accidents, falls, and burns.⁶ The 2023 NPDS report by the American Association of Poison Control Centers states that 39.6% of reported intoxication cases involved children under five years of age.¹ Most exposures in this age group occur in the home environment and are accidental; the most common agents involved are cleaning products, analgesics, and cosmetic and personal care products. Similarly, our study found that 52.4% of poisoning cases involved children under five years of age, and accidental ingestion was predominant in this group. Additionally, analgesics were found to be the most common toxic agents. These results are consistent with current NPDS data and demonstrate that accidental intoxications in childhood remain a significant concern.

Table 3. Time to emergency service presentation after intoxication according to age group and type of intoxication

Characteristics	Time to emergency service presentation after intoxication			p-value
	<1 h	1-6 sh	>6 h	
Child adolescent	(68.8%)	46 (46.9%)	11 (42.3%)	<0.001
	74 (31.2%)	52 (53.1%)	15 (57.7%)	
Accident suicide	176 (73.6%)	56 (57.7%)	13 (42.3%)	0.009
	63 (26.3%)	41 (42.3%)	12 (48%)	

**Figure 3.** Major treatment modalities in the intensive care unit and emergency department

When the months of presentation were examined, cases were most frequent in August (12%) and least frequent in January (4.9%), reflecting an increase during the summer season. This finding, consistent with the spring-summer increase reported by Zhang et al.⁷ differs from a more recent study conducted in Iran that reported an autumn peak.⁸ These findings suggest that the seasonal distribution of poisonings does not follow a fixed pattern; rather, it may vary depending on geographic location, cultural characteristics, and environmental factors. The seasonal trends reported in the literature are associated with numerous factors, including regional climatic conditions, lifestyle habits, access to household chemicals, school vacations, and increased time spent outdoors by children.

It has been reported that the increase observed during the summer months may be linked to children spending more time outdoors, having easier access to chemicals used for agricultural and cleaning purposes, and an increased likelihood of exposure to toxic substances in open areas.⁷ Additionally, changes in family routines and reduced supervision during the summer may increase the risk of exposure.

When cases are evaluated by age group, 52.4% are in the 0-5 age group and 39.6% are in the adolescent age group. Poisonings in the younger age group were largely accidental, whereas those during adolescence were frequently intentional. This finding is consistent with similar studies conducted in our country.^{9,10} The NPDS 2021 report also emphasizes that rates of intentional exposure have increased, particularly among female adolescents.¹¹ Various psychosocial factors may underlie the higher rates of intentional exposure among female adolescents. Depression, anxiety disorders, difficulties with emotional regulation, and a predisposition to self-harm are among the risk factors more frequently reported in this group. Additionally, the literature indicates that female adolescents tend to prefer less lethal methods compared to males and often engage in interventions such as medication ingestion.^{11,12}

When presentation times were evaluated, a significant proportion of children under five years of age were brought to healthcare facilities within the first hour after poisoning, whereas adolescents mostly presented within the 1-6 hour interval. This difference may be explained by earlier recognition by family members of exposure in younger children. In the study conducted by Guzel et al.,¹³ the mean time to presentation to the emergency department after intoxication in children was reported as 105 minutes. Similarly, NPDS 2023 data indicate that accidental exposures in the United States are generally recognized early, whereas intentional exposures (suicide attempts) are reported later, and this delay is associated with more severe clinical outcomes.¹

Mortality rates associated with pediatric poisonings are reported to be quite low in the literature ($\leq 0.05\%$).¹ In our

country, this rate has been reported to range between 0% and 5.4%.^{9,14,15} In our study, the mortality rate was found to be 0.5%. This low rate may be associated with early presentation, application of appropriate decontamination methods, and close monitoring in intensive care.

In the literature, it has been reported that 5% to 30% of beds in adult intensive care units are allocated to the monitoring of poisoning cases.¹⁶ Although this rate is more limited in pediatric intensive care units, in the series reported by Özkale and Özkale¹⁷, intoxication cases constituted 15.3% of all admissions. In our study, the proportion of poisoning cases among patients admitted to the pediatric intensive care unit was 19.1%. The higher rate compared to some pediatric series in the literature may be explained by the fact that the only pediatric intensive care unit in our province is located in our hospital, and that referrals from within the province and surrounding regions are largely directed to our center.

The route of exposure to the toxic agent is important for the clinical course and risk assessment. In our study, exposure occurred via the oral route in 83.1% of cases. This finding is consistent with the current literature, which indicates that oral intake is the most common form of exposure in childhood poisonings. In a multicenter study conducted in China, 96.8% of pediatric acute poisoning cases occurred through oral intake, and most of these cases were accidental.¹⁸ The predominance of oral exposure among younger age groups is thought to be related to the tendency of children under five to explore objects through their mouths and to their easy access to toxic substances commonly found in the home environment.

In a multicenter study, it was reported that poisoning via inhalation ranked second after oral intake, with CO remaining the primary agent in this group.¹⁸ Recent pediatric series show that inhalation poisonings, especially those caused by CO, can lead to significant morbidity. It is also emphasized that the clinical course may be more severe in cases of CO poisoning presenting with neurological symptoms.¹⁹

Similarly, inhalation was identified in our study as the second most common route of exposure to toxic substances. Despite the widespread use of natural gas, CO intoxications, still ranking second, suggest that coal use continues in the community. CO exposures are mostly caused by stoves, chimneys, and heating systems with inadequate ventilation and tend to increase, especially during the winter months.²⁰

When the causes of acute intoxications were examined, 70.8% of cases were found to be related to drug exposure. Paracetamol, antidepressants, and non-steroidal anti-inflammatory drugs were among the most common agents.

In the study reported by Sinanoglu and Berk²¹, drugs were also identified as the primary cause of pediatric poisonings, with non-steroidal anti-inflammatory drugs being the most

common agents at a rate of 21%. Similarly, Guzel et al.¹³ reported that 66.4% of poisoning cases were drug-related, and 23.4% of these were from the analgesic-antipyretic group. Taken together, these findings suggest that drugs continue to be the predominant factor in childhood poisonings because they are easily accessible and frequently used in the home.

Rodenticide exposures, which are expected to decrease with increasing urbanization, remain a notable cause of poisoning among children. In our study, the rate of rodenticide intoxication was 5.8%, which is consistent with current national and international studies. In a multicenter pediatric study, rodenticide exposure was reported at a rate of 6.7%.¹⁸ Studies conducted in Türkiye also indicate that the proportion of rodenticides in childhood poisonings is approximately 5-6%.^{13,22} The toxic agents that cause poisoning may vary by age group. In our study, the mean age of patients with rodenticide-related poisoning was significantly lower than that of patients with drug-related poisoning ($p=0.003$). This suggests that children, especially those aged 1-5 years, are at higher risk due to exposure to rodenticides left on the ground or otherwise readily accessible in the home.

Evaluation of the treatment methods applied in our study showed that supportive treatments and early decontamination interventions were prominent. Hydration therapy was administered in 60.6% of cases, indicating that maintaining hemodynamic stability is the primary approach in pediatric acute poisoning.

Additionally, the combined use of gastric lavage and activated charcoal in 58.8% of cases suggests that gastrointestinal decontamination plays an important role in clinical management, particularly in patients who present early. Current guidelines limit the use of gastric lavage to cases involving toxins with high lethality potential and to cases presenting within the first hour. Activated charcoal is accepted as an effective and commonly preferred decontamination method in early-presenting cases.²³

The administration of antidotes in 9.7% of cases and the preference for observation alone in 15.1% of cases indicate that individualized evaluation was performed in treatment management. The relatively low rates of advanced treatments, such as hyperbaric oxygen (1.5%) and mechanical ventilation (1.3%), demonstrate that critical cases were few, and that advanced life support approaches could be effectively applied when necessary.¹⁹

Study Limitations

First, due to its single-center and retrospective design, the study may have limitations related to missing records and data accuracy. Since the study included only cases admitted to the pediatric intensive care unit, mild cases and those managed at the emergency department or ward level were excluded

from the evaluation. In addition, practices in the emergency department and in intensive care were not analyzed separately. Furthermore, because long-term neuropsychiatric follow-up and post-discharge data were not available, the long-term outcomes of intentional exposures, particularly among adolescents, could not be assessed.

Conclusion

Such regional studies provide important data that can shape not only clinical management but also preventive medicine for pediatric emergency and intensive care services. Prevention of childhood intoxications can be achieved through developing local policies targeting toxic agents that are particularly prevalent in rural areas, enhancing environmental safety measures, and implementing community-based education programs.

Ethics

Ethics Committee Approval: Approval for the study was obtained from the Bolu Abant İzzet Baysal University Clinical Research Ethics Committee (approval no: 2018/204, date: 13.12.2018).

Informed Consent: Retrospective study.

Footnotes

Authorship Contributions

Concept: E.N.İ., Design: E.N.İ., M.B., N.K., Data Collection or Processing: M.B., Analysis or Interpretation: M.D., Literature Search: E.N.İ., N.K., Writing: E.N.İ., M.B., M.D.

Conflict of Interest: No conflict of interest was declared by the authors.

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