

Retrospective analysis of poisoning cases admitted to the emergency department between 2015 and 2020

A retrospective analysis of poisoning cases

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Abstract

Aim: Poisoning is defined as a clinical condition that occurs when one is exposed to an agent in an amount that can cause a toxic effect. Poisoning is a forensic case, regardless of its origin (an accident, suicide, or murder). In our study, we aimed to retrospectively analyze cases that presented to the emergency department with a diagnosis of poisoning between 2015 and 2020.

Material and Methods: Serious poisoning cases that presented to the emergency department of a densely populated training and research hospital in İstanbul and had a forensic case record were retrospectively examined in the hospital database. A total of 597 files with sufficient data and serious poisoning cases were included in the study. The data were numerically coded and analyzed on SPSS (Statistical Package for the Social Sciences) version 22 software package. The significance level was set at $\alpha=0.05$. Chi-square analysis was used to examine the relationship between categorical variables.

Results: In our study, it was determined that 55.95% of the cases recorded as poisoning were female, 44.05% were male, and 4% of the women were pregnant. The highest rate of poisoning occurred in autumn (29.23%), and the least occurred in adults in the winter months (22.11%).

Discussion: It was concluded that there is a need to raise the awareness of hospital personnel about keeping records of poisoning and forensic cases. It is important to keep patient records appropriately and completely.

Keywords

Poisoning, Forensic Medicine, Suicide, Toxicology

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Introduction

Poisoning is a clinical condition occurring as a result of exposure to an agent in an amount that can cause a toxic effect. If poisoning, which is frequently encountered in our country and the world, is not intervened timely and appropriately, it can lead to serious consequences. Poisoning can occur due to intentional suicidal attempts, by accident (often in children), environmental or occupational exposure, the side effects of drugs, therapeutic error (wrong drug, dose, and patient, and drug-drug / drug-food interaction), drug abuse, food poisoning, animal bites, and chemical and biological warfare. Poisonings are forensic cases regardless of their origin (an accident, suicide, or murder). Forensic medicine is responsible for recording and reporting poisoning cases and carrying out procedures in case of death [1]. For the substance entering the body to be documented as a poison, it should have chemical effects, be toxic before its intake, have a high toxic effect at low doses, and be an organic or inorganic substance or a substance produced by a living thing [2]. Poisoning cases are handled in articles 86, 87, 89, 186, and 280 of the Turkish Penal Code (TPC) [3].

Poisoning is often seen as a result of home accidents. For this reason, it is not always easy to distinguish between suicide and home accidents. In cases where the origin of poisoning is a murder, answers are sought to the questions of how, who, and when via the crime scene investigation and autopsy. Forensic medicine carries out an investigation of the story of the event, the characteristics of the deceased person, the crime scene, and the outcome after death [2].

The most frequent suicides in Turkey include hanging, taking multiple drugs, sharps and piercing tools, drowning, jumping from a height, and firearms [2]. Of all cases, poisoning varies between 0.1% and 1.04% domestically and globally [(available at: <https://tez.yok.gov.tr/UlusalTezMerkezi/TezGoster?key=4>)_FzTwrMCH4qBRopXPH4KPyA42CbQptS8wrQM-xswZm-i2KqFAIF306xS_Z9C) - 5]. Acute poisonings can be caused by drugs, narcotics, alcohol, pesticides, household chemicals, carbon monoxide, food, botulism, fungi, plants, and heavy metals. According to the 2011 data of the American Association of Poison Control Centers (AAPCC), anti-epileptic drug poisonings account for 1.86% of drug poisonings [6].

According to the report of the National Poisons Information Service (NPIS), the causes of poisoning in cases who presented to the center in 2020 were suicide (43.11%), accidents (37.78%), and food poisoning (3.70%), respectively. Other causes included environmental factors (2.35%), fires (0.04%), other (adverse effects, addiction, iatrogenic, occupational, and side effects) (5.33%), and unknown (1.55%). The total number of cases was 187,528. Types of poisoning were acute (85.97%), acute on a chronic basis (13.40%), chronic (0.32%), and other (0.31%) (available at: https://hsgm.saglik.gov.tr/depo/kurumsal/yayinlarimiz/Raporlar/Uzem/uzem_raporlari_2014-2020.pdf).

Material and Methods

After obtaining the ethics committee approval of the Üsküdar University Non-Interventional Research Ethics Committee on August 27, 2021 (61351342/AĞUSTOS 2021-04), the permission of the İstanbul Governorship Provincial Health Directorate was obtained on September 3, 2021 and the study

was initiated. The files that included a presentation to the emergency service with poisoning between January 1, 2015 and December 31, 2020 and a forensic case record were evaluated. A total of 597 files with enough data and serious poisoning cases were included in the study. Parameters that were obtained from the files and investigated in the study included season, age, gender, pregnancy status, poisoning agent, route of poisoning, the origin of poisoning, previous forensic case record, death/survival, communication with the poison information center, types of abused substances, and types of drugs. Cases were recorded on a Microsoft Excel spreadsheet. The data were numerically coded and analyzed on SPSS (Statistical Package for the Social Sciences) version 22 software package. The level of significance was determined as $\alpha=0.05$. Chi-square analysis was used to examine the relationship between categorical variables.

Ethical Approval

Ethics Committee approval for the study was obtained.

Results

According to the distribution of poisonings by season, the majority of the cases were observed in autumn with 29.65%, and the least were observed in winter with 22.11%. The route of exposure to the poison agent was oral in 90.98% of the cases, inhalation in 7.35%, and parenteral in 1.67%.

Table 1 shows the distribution of gender, pregnancy status, season, and the origin of poisoning by age. When all cases were examined without age restriction, it was seen that the majority of cases included females with 55.95%, while the rate of poisoning was 44.05% in males. Of the poisoning cases in children (0-18 years), 51.91% were female, 48.09% were male, and no pregnancy was found. Poisoning in children occurred mostly in autumn with 30.60%, and mostly by accident with

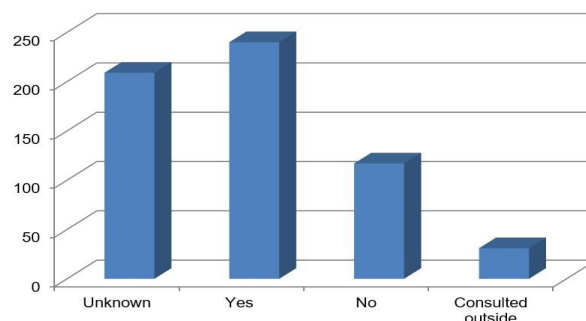


Figure 1. Calling the poison information center.

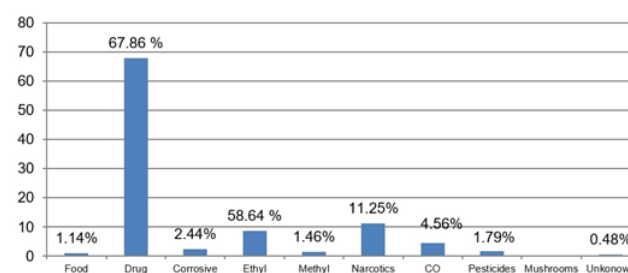


Figure 2. Poisoning agents.

Table 1. Distribution of gender, pregnancy status, season, and the origin of poisoning by age.

		Age groups					
		0-18		≥19		Total	
		f	%	f	%	f	%
Gender	Female	95	51.91	239	57.73	334	55.95
	Male	88	48.09	175	42.27	263	44.05
Pregnancy	No	183	100.00	405	97.83	588	98.49
	Yes	0	0.00	9	2.17	9	1.51
Season	Winter	39	21.31	93	22.46	132	22.11
	Spring	43	23.50	92	22.22	135	22.61
	Summer	45	24.59	108	26.9	153	25.63
	Autumn	56	30.60	121	29.23	177	29.65
Origin	Unknown	18	9.84	75	18.12	93	15.58
	Suicide	32	17.49	276	66.67	308	51.59
	Accident	130	71.04	51	12.32	181	30.32
	Suspicious	3	1.64	12	2.90	15	2.51

f: frequency

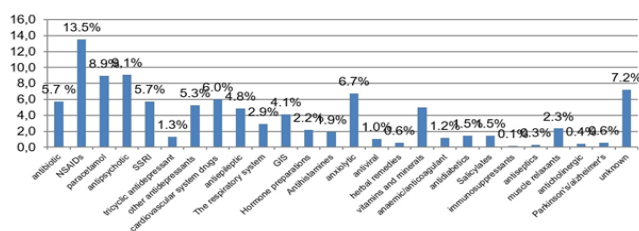


Figure 3. Types of drugs in drug poisoning cases.

Table 2. Poisoning agents by the origin of poisoning.

		Origin of poisoning							
		Unknown		Suicide		Accident		Murder	
		f	%	f	%	f	%	f	%
Food	No	93	100.00	307	99.68	175	96.69	15	100.00
	Yes	0	0.00	0	0.00	6	3.31	0	0.00
	Unknown	0	0.00	1	0.32	0	0.00	0	0.00
Drugs	No	57	61.29	23	7.47	92	50.83	9	60.00
	Yes	36	38.71	285	92.53	89	49.17	6	40.00
Who does the drug belong to?	No poisoning	54	58.06	27	8.77	87	48.07	10	66.67
	Yes	6	6.45	78	25.32	12	6.63	1	6.67
	No	2	2.15	12	3.90	41	22.65	1	6.67
	Unknown	31	33.33	191	62.01	41	22.65	3	20.00
Corrosive substance	No	91	97.85	301	97.73	175	96.69	15	100.00
	Yes	2	2.15	7	2.27	6	3.31	0	0.00
Ethyl alcohol	No	72	77.42	286	92.86	172	95.03	14	93.33
	Yes	21	22.58	22	7.14	9	4.97	1	6.67
Methyl alcohol	No	93	100.00	307	99.68	173	95.58	15	100.00
	Yes	0	0.00	1	0.32	8	4.42	0	0.00
Narcotics, stimulants	No	55	59.14	292	94.81	175	96.69	6	40.00
	Yes	38	40.86	16	5.19	6	3.31	9	60.00
CO	No	90	96.77	304	98.70	160	88.40	15	100.00
	Yes	3	3.23	4	1.30	21	11.60	0	0.00
Pesticides	No	91	97.85	301	97.73	178	98.34	15	100.00
	Yes	2	2.15	6	1.95	3	1.66	0	0.00
Mushrooms	No	93	100.00	308	100.00	179	98.90	15	100.00
	Yes	0	0.00	0	0.00	2	1.10	0	0.00
Unknown	No	91	97.85	307	99.68	181	100.00	15	100.00
	Yes	2	2.15	1	0.32	0	0.00	0	0.00

f: frequency

Table 3. Narcotic poisonings by age.

		Age groups					
		0-18		≥19		Total	
		f	%	f	%	f	%
Heroin	No	182	99.45	409	98.79	591	98.99
	Yes	1	0.55	5	1.21	6	1.1
Cannabis	No	182	99.45	411	99.28	593	99.33
	Yes	1	0.55	3	0.72	4	0.67
Synthetic cannabinoids	No	179	97.81	407	98.31	586	98.16
	Yes	4	2.19	7	1.69	11	1.84
Cocaine	No	183	100.00	413	99.76	596	99.83
	Yes	0	0.00	1	0.24	1	0.17
Benzodiazepine	No	183	100.00	413	99.76	596	99.83
	Yes	0	0.00	1	0.24	1	0.17
Amphetamine	No	183	100.00	410	99.03	593	99.33
	Yes	0	0.00	4	0.97	4	0.67
Opiates excluding heroin	No	183	100.00	413	99.76	596	99.83
	Yes	0	0.00	1	0.24	1	0.17
Other	No	182	99.45	397	95.89	579	96.98
	Yes	1	0.55	17	4.11	18	3.2
Unknown (suspicious cases)	No	182	99.45	389	93.96	571	95.64
	Yes	1	0.55	25	6.4	26	4.36
Thinner	No	182	99.45	411	99.28	593	99.33
	Yes	1	0.55	3	0.72	4	0.67

f: frequency

71.04%. Of the adult poisoning cases (aged 19 and over), 57.73% were female, 42.27% were male, and 2.17% were pregnant. Poisoning cases in adults mostly occurred in autumn with 29.23% and the majority of the cases were suicide with 51.59 %.

The source of the poisonings included suicide (51.59%), accidents (30.32%), unknown (15.58%), and suspicious (2.51%). The reason for the rate of 15.58% of unknown cases was that there was not enough information in some of the files and that they were kept incomplete.

When the pregnancy status of the poisoned females was evaluated, it was seen that while there was no pregnancy in cases under the age of 18, 9 cases over the age of 18 (4%) were pregnant. Also, 4% (44.44%) of these poisoning cases were related to drugs. Of the pregnant women, one had experienced heroin poisoning, one synthetic cannabinoid poisoning, and two amphetamine poisoning.

Figure 1 shows the distribution of calls made to the poison information center (phone number: 114). The center was called in 40.2% of poisoning cases and it was not called in 19.6%. While a consultation was performed in the external center in 5.2% of the cases, there was no information about 35% of the cases (Figure 1).

The poisoning agents were drugs in 67.86% of the cases, ethyl alcohol in 8.64%, narcotics in 11.25%, CO in 4.56%, pesticides in 1.79%, corrosive substances in 2.44%, mushrooms in .32%, unknown in 0.48%, and food in 1.14% (Figure 2).

Table 2 shows the distribution of poisoning active substances according to the origin of poisoning. Accordingly, 38.71% of unknown origin of poisoning, 92.53% of suicides, 49.17% of accidents, and 40% of murders were associated with drugs. In drug poisoning cases, multiple drug intake was 38.16%, single drug intake was 60.39%, and unknown was 1.45%. In poisoning with drugs, the drug belonged to the case in 23.32%, while it did not belong to the person in 13.46%. There was no information about who owned the drug in 63.22% of the cases. The drug poisoning cases included non-steroidal anti-inflammatory drugs (NSAIDs) in 13.5%, antipsychotic in 9.1%, paracetamol in 8.9%, anxiolytics in 6.7%, cardiovascular system drugs in 6.0%, selective serotonin reuptake inhibitor (SSRI) in 5.7%, antibiotics in 5.7%, other antidepressants in 5.3%, and vitamins/minerals in 5% (Figure 3).

Table 3 shows the distribution of narcotic poisonings by age. The number of narcotic poisonings in children was very low. Synthetic cannabinoids were the causes of the majority of narcotic poisonings in children (2.19%). Adults had higher rates of narcotic poisonings, with a maximum of 6.04% from narcotics of unknown origin and 4.1% from other category narcotics.

It was seen that the files were kept incomplete and the drug type was not shared by patients or their relatives. Due to the lack of information, it was revealed that the majority of cases presented to the unit with a suspicion of narcotics, which was followed by the other category. The majority of narcotics in the known cases included cannabis, which was followed by heroin (Figure 3).

Discussion

Poisoning is recognized as a public health problem. In forensic medicine, all cases of accidents, suicides, and murders are forensic cases. In all cases, poisoning cases vary between 0.1% and 1.04% domestically and globally [(available at: <https://tez.yok.gov.tr/UlusalTezMerkezi/TezGoster?key=4>)_FzTwrMCH4qBR0pXPH4KPyA42CbQptS8wrQM-xswZm-i2KqFAIF306xS_Z9C], 5]. In our study, the rate in five years was 0.02%, which is quite low compared to the literature. This was thought to have been due to the examination of only serious poisoning cases obtained from the files which had a forensic case record. Only 597 of the examined files could be included in the study. Poisoning cases without a forensic case record and simple poisonings were excluded from the study.

When we look at the distribution of poisonings by months, the highest number of poisonings was observed in November. According to seasonal distribution, the highest number of cases was in autumn (29.65%), and the least in winter (22.11%). In the domestic literature, it was stated that poisoning cases increased in the spring and summer months [(available at: <https://tez.yok.gov.tr/UlusalTezMerkezi/TezGoster?key=4>)_FzTwrMCH4qBR0pXPH4KPyA42CbQptS8wrQM-xswZm-i2KqFAIF306xS_Z9C], (available at: <https://hdl.handle.net/11630/6768>) -7]. The cases were found to mostly occur between 18.01 and 24.00 with 37.4%, and the least poisoning was found to occur between 06.00 and 12.00 with 13.6%.

Considering the genders, it was found in the literature that the majority of the poisoning cases were female [(available at: https://hsgm.saglik.gov.tr/depo/kurumsal/yayinlarimiz/Raporlar/Uzem/uzem_raporlari_2014-2020.pdf)]-4-8]. Consistent with the literature, our research revealed that women experienced poisoning more frequently with 55.95%, while the rate of poisoning among men was 44.05%.

Of the poisoning cases in children (0-18 years), 51.91% were female, 48.09% were male, and no pregnancy was found. The majority of poisoning cases in children were in autumn (30.60%), and most of them were accidental (71.04%). The rates of childhood poisoning were consistent with the literature. For example, Berksoy et al. reported that the majority of poisoning cases were in the autumn and summer months and the rate of cases was 59.3% in females and 40.7% in males. The rate of accidental poisoning in children was 79% [9]. In our study, the majority of poisoning cases in children were in the autumn (56%) and summer (45%) months.

The origins of poisoning included suicides (51.59%), accidents (30.32%), unknown causes (15.58%), and suspicious cases (intentional) (2.51%), respectively. The reason why the rate of cases with unknown origin was 15.58% was due to the lack of enough information in the files and keeping them incomplete. The highest rate of suicidal poisoning was consistent with the literature. Some studies in the literature mostly mentioned suicidal poisonings [4-10]. According to the 2020 report of the NPIS, the origin of 43.11% of the cases were suicidal and 37.78% were accidental (available at: https://hsgm.saglik.gov.tr/depo/kurumsal/yayinlarimiz/Raporlar/Uzem/uzem_raporlari_2014-2020.pdf). This is consistent with the results of

our research. In our study, 92% of drug poisonings were suicidal. In another study, 99.55% of drug poisonings were found to be suicidal [11]. The suicide rate was found to be 56.7% in another source [5]. Moreover, the suicide rate was 84.9% in the study of Ergun et al. [12].

Poisoning agents included drugs (67.86%), ethyl alcohol (8.64%), narcotics (11.25%), CO (4.56%), pesticides (1.79%), corrosive substances (2.44%), mushrooms (0.32%), unknown agents (0.48%), and food (1.14%). In another study, poisoning agents were found as drugs (80%), narcotics (2.7%), and alcohol (3.7%) [13].

Drug poisonings rank first in our country. In the study by Akköse et al., the rate of drug poisoning was 58.6% [11]. In another study, drug poisoning was 82% [4]. In our study, drug poisoning took first place with 67%. Drugs involved in poisoning were NSAID (13.5%), antipsychotics (9.1%), paracetamol (8.9%), anxiolytics (6.7%), cardiovascular system drugs (6.0%), SSRI (5.7%), antibiotics (5.7%), other antidepressants (5.3%), and vitamins/minerals (5%). Drug active ingredients vary in the literature. For example, in the study conducted by Selçuk and Çakar, the most common drugs involved in poisoning were antidepressants with 30% [14]. Kıyan et al. found analgesics as the most common drugs in suicidal poisonings with 56% [4]. In foreign literature, the most common drugs involved in poisoning were sedative and hypnotic drugs with 28.8%, analgesics with 16.6%, and psychotropic drugs with 16.4% [15]. According to the 2019 report of NPIIS, drug poisoning with anti-inflammatory drugs occurred at a rate of 9.8% (available at: https://hsgm.saglik.gov.tr/depo/kurumsal/yayinlarimiz/Raporlar/Uzem/uzem_raporlari_2014-2020.pdf). Also, 38.71% of cases of unknown origin of poisoning, 92.53% of cases of suicidal origin, 49.17% of cases of accidental origin, and 40% of suspicious cases were carried out with drugs. In a study conducted in Kars province in Turkey, multiple drug intake was found to be 26.53% [16]. This rate was found as 16.4% in a study conducted abroad [5].

In a study on childhood poisoning, it was found that the cause of 43.6% of the poisonings were drugs, 28.3% were corrosive substances, 21.5% were other chemicals, and 2.78% were drug intoxication [17]. In a study conducted at Dicle University between 2015 and 2018, the cause of 59.4% of childhood poisoning were drugs, which was followed by corrosive substances with 17.4% and pesticides with 10.1% (available at: <https://hdl.handle.net/11468/7128>).

Conclusion

In conclusion, all poisoning cases must be reported to relevant authorities. It is necessary to raise awareness among hospital staff about this issue. Patient records must be kept properly and completely. It is thought that health workers need education, information on legal issues, and in-service training. Public awareness should be raised at the social level. Medication errors and inappropriate use of chemicals can cause accidental poisoning. Keeping these chemicals in locked places can reduce the risk of poisoning. Receiving psychotherapy and psychiatric support when necessary can reduce the risk of suicide. It is especially important for people who use antidepressants to be under regular physician control. Prevention of unconscious and uncontrolled purchase and use of medicines can help reduce the incidence of poisoning. It is also important to control the drugs

or the products under the name of food supplements sold on the Internet to prevent the wrong use of medicines. Prevention of the sale of drugs without a prescription is the most important precaution to be taken.

Scientific Responsibility Statement

The authors declare that they are responsible for the article's scientific content including study design, data collection, analysis and interpretation, writing, some of the main line, or all of the preparation and scientific review of the contents and approval of the final version of the article.

Animal and human rights statement

All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. No animal or human studies were carried out by the authors for this article.

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Conflict of interest

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References

1. İzdeş S. Zehirlenmelerde tanı yöntemleri (Diagnostic methods in poisoning). *Türk Tıp Dergisi/ Turkish Journal of Medicine*. 2011;5(2):85-93.
2. Polat O. Kriminoloji ve Kriminalistik Üzerine Notlar (Notes on Criminology and Criminalistics). Ankara: Seçkin Yayıncılık; 2015. p.198-9.
3. Çetin G. Türk Ceza Kanunu Açısından Yaralar (Wounds in Terms of Turkish Penal Code). İstanbul: İ.Ü. Basım ve Yayınevi Müdürlüğü; 2011. p.241-54.
4. Kıyan S, Öz Saraç M, Ersel M, Yürüktümen A, Karahallı E, Özçete E, et al. Akut zehirlenme hastalarının iki yıllık değerlendirilmesi (Two-year evaluation of acute poisoning patients). *Turkish Journal of Emergency Medicine*. 2009;9(1):24-30.
5. Zhang Y, Yu B, Wang N, Li T. Acute poisoning in Shenyang, China: a retrospective and descriptive study from 2012 to 2016. *BMJ Open*. 2018;8(8):e021881.
6. Bronstein AC, Spyker DA, Cantilena LR, Jr, Rumack BH, Dart RC. 2011 Annual report of the American Association of Poison Control Centers' National Poison Data System (NPDS): 29th Annual Report. *Clin Toxicol (Phila)*. 2012;50(10):911-1164.
7. Kosenli O, Satar S, Ay MO, Kosenli A, Acikalin A, Kozaci N, et al. Analysis of Pharmaceutical Poisonings in Adults Occurred in Adana Region of Turkey in North Eastern Mediterranean. *Acta Medica*. 2014;30:585.
8. Shazia S, Wazir AH, Ur Rashid H, Khalil ZH. Three years analysis of poisoning cases of forensic medicine toxicological laboratory, Khyber Medical College, Peshawar. *J Ayub Med Coll Abbottabad*. 2020;32(2):250-4.
9. Berksoy EA, Çelik T, İşgüder R, Karaaslan U, Ağın H, Yılmaz AK, et al. Çocukluk çağı zehirlenme olgularının demografik özelliklerinin değerlendirilmesi (Evaluation of demographic characteristics of childhood poisoning cases). *Journal of Dr Behcet Uz Children's Hospital*. 2014;4(1):25-30.
10. Büyüker SM, Çamur NSK. The Examination of Suicide Cases with Antidepressant Use Applied to National Poisoning Counseling Center Between 2015-2018. *Journal of Anatolian Medical Research*. 2021; 6(1):1-6.
11. Aydın ŞA, Köksal Ö, Fedakar R, Emircan Ş, Durmuş O. 1996-2004 Yılları Arasındaki Erişkin Zehirlenme Olguları (Adult Poisoning Cases between 1996-2004). *Uludağ Üniversitesi Tıp Fakültesi Dergisi*. 32(1):25-7.
12. Ergun B, Çevik A, İlgin S, Atlı Ö, Saraçoğlu A, Acar N, et al. Acute drug poisonings in Eskisehir, Turkey: A retrospective study. *Turkish Journal of Pharmaceutical Sciences*. 2013;10:303-12.
13. Aydın A. Yoğun Bakım Ünitesinde Takip Edilen Zehirlenme Olgularının Değerlendirilmesi: Retrospektif Çalışma (Evaluation of Poisoning Cases Followed Up in the Intensive Care Unit: A Retrospective Study). *Firat Tıp Dergisi*. 2019;24(3):129-33.
14. Selçuk M, Çakar N. Tek Merkez Kaynaklı Akut Zehirlenme Analizleri: Altı Yıllık Olgu Verisi (Single-Center Analysis of Acute Intoxication: Six-Year Data Case). *Türk Yoğun Bakım Dergisi*. 2015;13(2):57.
15. Albals D, Yehya A, Issa R, Fawadleh A. Retrospective assessment of acute poisoning incidents by nonpharmaceutical agents in Jordan: Data from Pharmacy One™ Poison Call Center, 2014 to 2018—Part I. *Pharmacol Res Perspect*. 2020;8(2):e00582.
16. Dolanbay T, Gül HF, Murat A, Atalay E, Geçgel G. Acil servise başvuran zehirlenme vakalarının retrospektif analizi: Kars ili örneği (Retrospective analysis of poisoning cases admitted to the emergency department: The case of Kars province). *Kafkas Tıp Bilimleri Dergisi*. 2019;9(3):153-7.
17. Yazar A, Akın F, Türe E, Odabaş D. Çocuk acil kliniğine başvuran adli vakaların değerlendirilmesi (Evaluation of forensic cases admitted to the pediatric emergency clinic). *Dicle Tıp Dergisi*. 2017;44(4):345-53.

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