

ACUTE DRUG POISONINGS IN ESKISEHIR, TURKEY: A RETROSPECTIVE STUDY

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Abstract

The aim of this study was to characterize acute drug-poisoning cases admitted to the Adult Emergency Service of ESOGU Medicine Faculty Hospital, Turkey. All acute drug-poisoning cases admitted to the emergency service from January 2003 to December 2009 were evaluated retrospectively. For this purpose; age, gender, admission date, vital signs, symptoms, the types of drugs used, purpose of drug intake, alcohol co-ingestion, treatment procedures and patient outcomes were recorded. According to the results, 68.6 % of cases was female and 31.4 % was male. The mean age of all cases was 28.16 ± 11.74 , being 27.26 ± 10.48 in women and 32.16 ± 13.53 in men. The purposes of drug intake were found as; 84.90 % for suicidal attempts, 9.70 % for treatment purposes, 4.30 % for accidental drug poisonings and 1.20 % for drug abuse. Psychoactive drugs were the most common drugs causing acute drug-poisoning events while analgesics were the secondary causative drug group. Central nervous system symptoms were the major symptoms observed which were followed by gastrointestinal symptoms. 64.60 % of the cases stayed at least one day in the hospital. Patient outcomes were as follows: 98.7 % discharge with full recovery, 0.7 % recovery with sequel related to intoxication and 0.6 % resulted in death.

Key words: Emergency service, Drug poisoning, Retrospective, Suicidal

Eskişehir’de Akut İlaç Zehirlenmeleri: Retrospektif Bir Çalışma

Bu çalışmada ESOGU Tıp Fakültesi Hastanesi Yetişkin Acil Servisine Ocak 2003 - Aralık 2009 yılları arasında başvuran akut ilaç zehirlenme olgularının retrospektif olarak değerlendirilmesi amaçlanmaktadır. Bu amaçla olgulara ait yaş, cinsiyet, başvuru tarihi, vital bulgular, semptomlar, kullanılan ilaçlar, ilaç alım amacı, beraberinde alkol alınıp alınmadığı, uygulanan tedavi prosedürü ve sonuçlar kayıt edildi. Sonuçlara göre, olguların % 68.6’ sının kadın ve % 31.4’ ünün erkek olduğu belirlendi. Tüm olguların yaş ortalaması 28.16 ± 11.74 , kadınların yaş ortalaması 27.26 ± 10.48 ve erkeklerin yaş ortalaması 32.16 ± 13.53 olarak hesaplandı. İlaç alım amaçları olguların % 84.90’ ında özkıyım, % 9.70’ sinde tedavi, % 4.30’ unda kaza ve % 1.20’ sinde ilaç suistimali olarak tespit edildi. Psikoaktif ilaçlar ilaç zehirlenmelerinin en sık nedeni olarak belirlenirken analjezikler ikinci etken olarak tespit edildi. Akut ilaç zehirlenmesine bağlı olarak meydana gelen santral sinir sistemi semptomları major semptomlar olarak belirlenirken gastrointestinal sistem semptomlarının onu izlediği gözlemlendi. Olguların % 64.60’ ının en az 1 gün hastane yatışı aldığı gözlemlendi. Olguların % 98.7’ sının tamamen iyileştiği, % 0.7’ sinin sekelli olarak iyileştiği ve % 0.6’ sının öldüğü belirlendi.

Anahtar kelimeler: Acil servis, Retrospektif, İlaç zehirlenmesi, Özkıyım

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INTRODUCTION

Poisoning is a significant public health problem and one of the most common causes of admittance to the emergency departments worldwide (1-10). Increase in the availability and use of the chemical substances in medicine, industry, agriculture and daily life cause augmentation in the risk of poisoning all over the world (1, 11-13).

Incidence and characteristics of the poisonings vary from country to country. However, the true extent of poisoning incidence may be difficult to determine since there are always cases that are never reported. As Turkey is a developing country and changing from an agricultural to an industrialized economy, an established poisoning database is not adequate although three drug and poison information centers (Refik Saydam National Public Health Agency: Poison Consultancy Center, Dokuz Eylul University Drug and Poison Information Centre, Poisoning Uludag University Drug and Poison Information Centre) and two drug and poison information units (Hacettepe University Drug and Poison Information Unit and Yeditepe University Drug and Poison Information Unit) are present throughout Turkey. Therefore, the studies of acute drug poisoning data represent valuable information about the poisoning pattern of Turkey as well as other developing countries. As an example, drugs were found to be the predominant agents of acute poisonings in other developing countries like Malaysia, Iran and Thailand (8, 11, 13). The majority of the patients involved in acute drug poisonings were females in Malaysia and Iran (11, 13). The drug group which was the main causative of acute poisonings was different among the countries.

On the basis of the data obtained from Turkish Ministry of Health: injury, poisoning and certain other consequences of external causes-related deaths were reported approximately 2.8% of all hospital deaths in 2008 (14). In studies on acute adult poisonings in Turkey, it was reported that the number of suicidal and accidental poisonings was increased. According to the most recent studies from different parts of Turkey, acute poisoning cases were 0.7-2.4% of all emergency admissions (3-6).

Medicinal drugs are the most frequent reason of the accidental and suicidal acute poisonings such as food, pesticide and carbon monoxide (1-6, 15-19). In England and Wales, 1917 deaths from drug poisonings were reported between 2003 and 2007 (20). In 2007, a total of 38371 people died due to drug-induced causes in the United States (21). Previous studies showed that drugs were also the most common cause of poisonings in Turkey (3-6).

The aim of the present study was to determine demographic properties, etiological and clinical characteristics of acute drug poisoning among adult patients who admitted to Emergency Service of Eskişehir Osmangazi University Medicine Faculty Hospital, retrospectively. This study was undertaken to assess the effects of variables such as age, gender, admission date, vital signs, symptoms, the types of drugs used, ingestion purpose, treatment procedures, alcohol co-ingestion, length of the stay in the hospital, patient outcomes and the rate of mortality on drug poisoning frequency.

EXPERIMENTAL

This retrospective study was carried out by reviewing the records of people who admitted to Adult Emergency Service of Eskişehir Osmangazi University Medicine Faculty Hospital, with the complaint of acute drug-poisoning, between January 1, 2003 and December 31, 2009. Osmangazi University Medicine Faculty Hospital is the largest health center in Eskişehir. Therefore, other hospitals in Eskişehir and neighbor cities transfer the patients who get worse or need further investigation to this hospital. The Adult Emergency Service of Eskişehir Osmangazi University Medicine Faculty Hospital accepts over 30.000 patients annually. Currently, adult and pediatric emergency service patients are separated in Eskişehir Osmangazi University Medicine Faculty Hospital.

The inclusion criteria for the present study was to have diagnosis of acute drug-poisoning as an adult (≥ 16 years) admitted to emergency service. All of the cases were oral intoxications.

Emergency service staff prepared standardized patient forms which were completed after the arrival of the patient to the service. The form requested information about the patient and the visit, such as demographics (gender and age); admission date; reason for visit; diagnoses; vital signs; urgency; procedures provided; and the treatment outcome. The diagnosis was established by history, physical examination, routine and toxicological laboratory evaluation.

In our study, the patients who were diagnosed as acute drug-poisoning were evaluated. We prepared forms suitable for our study purposes and completed them from the obtained data of standardized emergency service patient forms.

Demographics data (age and gender), admission date, vital signs, symptoms, the types of drugs used, alcohol co-ingestion, ingestion purpose, treatment procedures, length of stay in the hospital and the outcome of the patients were recorded in our poisoning form.

The patients whose blood pressure was below 80-125 mmHg were determined as hypotensive. The values above 80-125 mmHg were accepted as hypertensive. The pulse values between 60–100/minute were evaluated as normocardic, the values under 60/minute were bradycardic and the values above 100/minute were tachycardic. The respiratory rates between 14–20/minute were accepted as normal, the values under 14/minute were bradypneic and the values above 20/minute were tachypneic. The patients whose body temperature was above 37.3°C were accepted to have fever.

Ingestion purposes were classified as suicidal, accidental, abuse and treatment. (1) Suicidal: An exposure resulting from the inappropriate use of a drug for reasons that were suspected to be self-destructive. (2) Accidental: Resulted in the wrong dose, incorrect route of administration, administration to the wrong person, or administration of the incorrect drug. (3) Abuse: An exposure resulting from the intentional improper or incorrect use of a drug in which the victim was likely attempting to achieve a euphoric or psycho-tropic effect. (4) Treatment: The adverse effects which occurs when a drug was used in pharmacological doses.

Drugs were categorized into eleven groups: Psychoactive drugs, analgesic drugs, antibiotic drugs, cardiovascular drugs (CVD), antihistaminic drugs, antiepileptic drugs, supplements (vitamins and/or minerals), antiulcer drugs, drugs for common cold (DCC), others (antidiabetic, antiemetic etc.), and unknown drugs. Symptoms were classified as central nervous system (CNS), respiratory system (RS), cardiovascular system (CVS), gastrointestinal system (GIS), urogenital system (US), muscle-skeletal system (MSS), dermatological (D) and other symptoms.

Standard treatment protocols were gastric lavage, activated charcoal, intubation, specific antidote, emesis, and symptomatic treatment. Advanced treatment protocols were processes such as dialysis and surgery.

Hospitalization time was categorized in three groups: stayed at hospital less than a day, more than a day and referred to the other hospitals. Patient outcomes were classified as: full recovery, recovery with sequel and death.

To evaluate the differences, chi-square test was performed using SPSS for Windows, version 10.0. *p* value of less than 0.05 was considered to be significant. The prevalence of data was also presented in our study.

RESULT AND DISCUSSION

The poisonings increase annually and represent a frequent cause of admission to emergency services worldwide (2, 6, 7, 22, 23). The epidemiological studies on acute drug poisoning events were limited in Turkey. Therefore we aimed to identify the demographical and clinical characteristics of acute drug-poisoning cases to make a contribution to the whole picture. Eskisehir has a population of about 700.000 and 40.000 of them are students of the universities in Eskisehir. It is the one and only province which has such a high ratio of young

population in boundaries of Turkey. Eskisehir, not only representing a young population-based province but also it seems to be a major health centre for surrounding cities due to the high number of referred patients from neighborhood. Therefore Eskisehir can be accepted as a regional representation of Turkey.

There were 1380 acute drug-poisoning cases among 217107 patients admitted to the emergency service between 2003 and 2009. These cases were 0.64% of all emergency admissions. Results of the epidemiological studies demonstrated that the percentage of poisonings among the total number of emergency admissions altered between 0.7% and 2.4% (3-6, 19, 24). All poisoning causes such as drugs, corrosive substances, food, pesticides and carbon monoxide were included in these studies. According to these data, drugs were the most common cause of poisonings (3-6, 19). Our results showed that drug-poisoning cases composed 0.64% of all emergency admissions. The mentioned percentage was lower than that of other studies because only drug-poisoning cases were examined in this study.

Mean age of all cases was 28.16 ± 11.74 . The mean age distribution according to drug intake purpose was: 27.5 ± 10.18 years for suicidal attempts, 29.37 ± 15.67 years for accidental drug intake cases, 29.91 ± 13.23 years for drug abuse cases and 38.97 ± 17.21 years for treatment-related events. Additionally, mean age of the patients with drug intake for suicidal attempts was found lower than drug intake for treatment intents.

The drug-poisoning cases were occurred in females (n- 947, 68.6%) more frequent than males (n- 433, 31.4%) with a ratio of 2.19:1, and the mean age of female cases was lower than the male cases (27.26 ± 10.48 and 32.16 ± 13.53 , respectively; $p < 0.001$). Similar results were shown in other studies (1, 3, 4, 6, 11-13, 17-19, 23). With respect to these results, it might be postulated that adult women are more susceptible to drug-poisoning than men.

The number of cases for each drug intake purpose was: 1171 patients (84.9%) for suicidal attempts, 16 patients (1.2%) for accidental drug intake, 59 (4.3%) for drug abuse and 134 cases (9.7%) for treatment-related events (Figure 1). Distribution of drug intake purposes upon gender was found as 809 female and 362 male for suicide, 9 females and 7 males for accidental drug use, 32 females and 27 males for drug abuse and 97 females and 27 males for treatment-related events. Number of the acute drug-poisoning cases was highest in the year 2004 (Figure 2.).

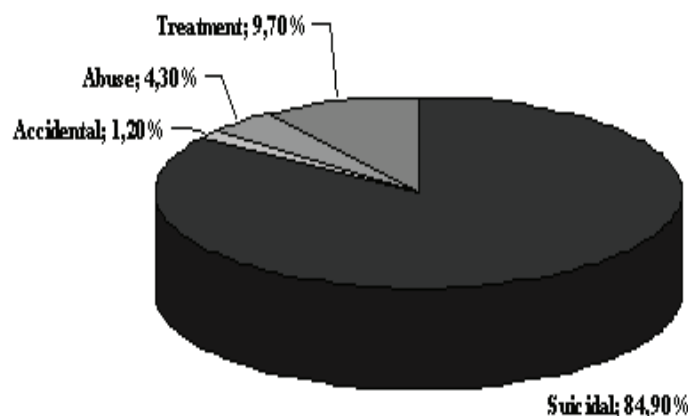


Figure 1. Distribution of Acute Drug Poisoning Cases According to Intake Purposes (%). 1171 cases for suicidal attempt, 16 cases for accidental drug poisonings, 59 for drug abuse and 124 cases for treatment related drug poisonings.

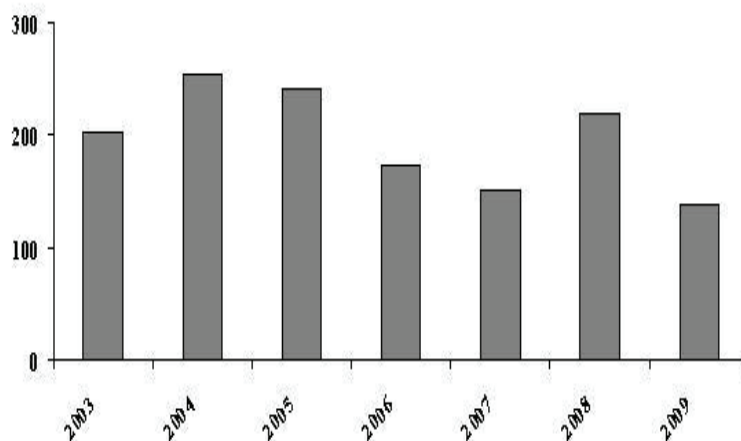


Figure 2. Distribution of Acute Drug Poisoning Annually (n). 202 cases for the 2003, 255 cases for the 2004, 241 cases for the 2005, 173 cases for the 2006, 152 cases for the 2007, 219 cases for the 2008, 138 cases for the 2009.

Suicidal drug intake was the most important cause of poisoning for both of the gender (1-7, 12, 15, 17, 25, 26). In a study which was conducted to determine the acute poisoning pattern in Diyarbakir, Turkey, from the records of a university hospital between January to December 2000, it was found that 36.5% of the cases were accidental whereas 63.5% were deliberate poisoning. In suicidal attempts, intoxications were more common in females (71.3%) (2). In other studies which were performed to evaluate acute adult poisonings of university hospitals in Istanbul, Ankara and Mersin retrospectively, the majority of the patients with suicidal attempts were females (3, 4, 5).

Our results also showed that the most of drug poisonings were related to overdose drug intake for suicidal purposes. Factors such as unemployment, familial problems, pangs of love and economic distress may increase the number of suicidal attempts. Probably, since these causal factors are found more often in younger adults, the mean age of suicidal attempts may be lower. On the other hand, the higher rate of suicidal drug use in women may be due to the extent of psychological stress in young women and their inclination for suicidal attempts (11, 27, 28). These factors were not evaluated in this study.

The age group of 17-37 years was at high risk for suicidal drug poisoning. The combination of pharmacotherapy and psychological intervention in the acute setting, identification of high risk groups, control of social contagion involving the influence of the media, and the ability of the major institutions in prevention, were suggested by some authors to be crucial in minimizing suicide attempts (12).

In our study 78.74% of the suicide cases were administered psychiatric consultation by the psychiatrists of the hospital. Consultation by the psychiatrist is one of the important modalities of treatment in a case of suicidal poisoning as it helps an individual to prevent herself/himself from such attempts in future. Psychiatric assessment was associated with a twofold reduction in repetition of suicide in the United Kingdom (29). Psychiatric assessment should be performed on all patients presenting with self-poisoning.

While 52.39% of all drug-poisoning cases was due to a single drug, 47.61% of the cases was resulted from two or more drugs. Psychoactive drugs were the most common agents (n-664) used in drug-poisonings. They were followed by analgesics (n-463), other group drugs (n-236), antibiotics (n-184), CVS drugs (n-122), antiepileptics (n-103), drugs for common cold (n-101), antiulcer drugs (n-75), supplements (vitamins and/or minerals) (n-66) and antihistaminics (n-38), respectively (Figure 3). 23.8% (n-104) of male subjects and 8% (n-76) of female subjects ingested drugs with alcohol. The difference between genders was statistically

significant ($p < 0.001$). Some authors have also reported that psychoactive drugs were the most common cause of drug poisonings (1-3, 5, 15, 16, 18, 25). On the other hand, analgesics were the most commonly used drugs in other studies (4, 11, 17, 19). Similar results were obtained from retrospective studies in different regions of Turkey. For example in Diyarbakir, psychoactive drugs were the most common cause of acute adult drug poisonings among the others (2). In other studies which were performed to evaluate acute adult poisonings of university hospitals in Istanbul, Ankara and Mersin retrospectively, the most frequently used drugs were found to be antidepressants followed by analgesics (3-5). The widespread prescription of psychoactive and analgesics and their easy availability domestically might be responsible for this high ratio.

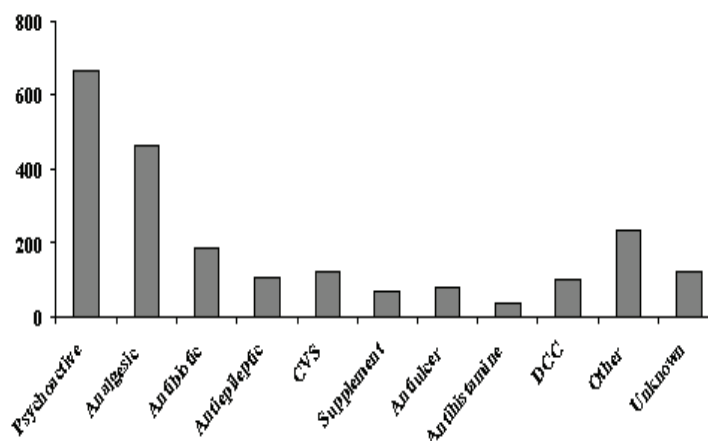


Figure 3. Distribution of Drugs in Acute Drug Poisoning Cases (n). Psychoactive drugs (n=664), analgesic drugs (n=463), other group drugs (n=236), antibiotics (n=184), CVS: cardiovascular system drugs (n=122), antiepileptic drugs (n=103), DCC: drugs for common cold (n=101), antiulcer drugs (n=75), supplements (n=66) and antihistaminic drugs (n=38).

Analgesics and antibiotics were found to be the most common drug groups in treatment-related events. Adverse drug events (ADEs) occur frequently with antibiotic and non-steroidal inflammatory drugs (30, 31). The Food and Drug Administration statistics showed that the number of deaths reported to the adverse event reporting system was 63.846 in 2009 (32). The adverse effects occur by multiple drug usage because of age, disease or hypersensitivity to the drug used. Old age is known to be a risk factor for ADEs (23, 30, 31). The elderly population suffers from a higher rate of morbidity due to ADEs compared with other age groups. This might be due to a higher incidence of chronic diseases and, thus, a higher consumption of medication. ADEs also occur more commonly in this age group and are implicated in 10–20% of acute geriatric admissions (10). Also in our study, the mean age of treatment-related drug poisonings was determined higher than the other cases belonging to other purposes of drug intake.

CNS symptoms such as unconsciousness, seizure, coma etc. were found as the most common occurred symptoms (n=647) in drug-poisonings. They were followed by GIS symptoms (n=426) (nausea, vomiting, stomach pain, diarrhea etc.), CVS symptoms (n=114) (arrhythmia, chest pain, cardiac arrest etc.), MSS symptoms (muscle pain and muscle rigidity etc.) (n=97), RS symptoms (hyperventilation and difficulty of breath etc.) (n=86), D symptoms (symptoms of allergic reactions such as rash) (n=61) and UGS symptoms (miction and urinary retention etc.) (n=8) and other symptoms (n=5), respectively (Figure 4). There was no significant difference between the gender according to the symptoms occurred.

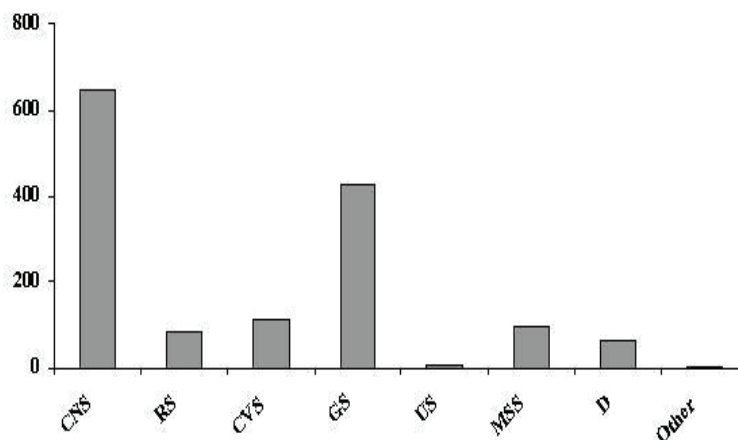


Figure 4. Distribution of Symptoms in Acute Drug Poisoning Cases (n). CNS: central nervous system (n=647), RS: respiratory system (n=86), CVS: cardiovascular system (n=114), GIS: gastrointestinal system (n=426), US: urogenital system (n=8), MSS: musculo-skeletal system (n=97), D: dermatological (n=61) and other symptoms (n=5).

Vital signs of all cases were normal in general. While hypotension and tachicardia were more evident in female than male, hypertension was more evident in male than female. Sixteen of all women cases had fever. These differences between the genders in terms of the vital signs were statistically significant ($p < 0.005$).

It was noted that 97.8% (n=1350) of all cases received standard treatment protocols such as gastric irrigation, activated charcoal, specific antidotes, gastroprotective treatment, emesis and symptomatic treatment. 2.2% of the patients (n=30) were administered advanced treatment protocols such as dialysis, surgery etc.

64.64% of 1380 patients (n=892) were stayed at hospital for at least 1 day, 1.16% of the patients (n=16) were transferred to the other hospitals and 34.20% of the patients (472) were ambulatory or left the hospital on their own. Outcomes of the cases were as follows: 98.7% full recovery (n=1393), 0.7% (n=9) recovery with sequel related to intoxication and 0.6% (n=8) death. Distribution of drug intake purpose in patients recovered with sequel was high dose drug intake for suicidal attempt in 6 patients and treatment related sequel in 3 patients. No significant difference was determined between the gender according to hospitalization time and outcome of the patients. Distribution of parameters in terms of gender is presented in Table 1. Mortality due to acute poisonings was calculated as 0.6–2.6% in other studies (1-7, 11, 15, 19). The reason for the low mortality rate in our study might be explained by the intake of drugs below lethal dose and providing rapid and effective treatment approaches to poisoning cases.

Table 1. Distribution of the recorded parameters in terms of gender.

Parameters	Female		Male	
	(n)	(%)	(n)	(%)
Patients	947	68.6	433	31.4
Blood pressure				
Hypotensive	262	27.7	97	22.4
Normal	408	43.1	184	42.9
Hypertensive	277	29.3	152	35.1
Pulse				
Bradycardic	21	2.2	11	2.5
Normal	630	66.5	320	73.9
Tachycardic	296	31.3	102	23.6
Respiratory rate				
Bradypneic	17	1.8	10	2.3
Normal	611	68.3	284	65.6
Tachypneic	319	33.7	139	32.1
Fever				
Yes	16	1.7	1	0.2
No	931	68.4	432	99.8
Treatment				
Standard protocols	931	98.3	419	96.8
Advanced protocols	16	1.7	14	3.2
Hospitalization time				
≤ 1 day	336	35.5	136	31.4
> 1 day	600	63.4	292	67.4
Transfer to other hospital	11	1.2	5	1.2
Outcome				
Full recovery	939	99.2	424	97.9
Recovery with sequel	5	0.5	4	0.9
Death	3	0.3	5	1.2

Hypotension was significant in female whereas hypertension was significant in male. Tachycardia was significant in females in comparison with men statistically. Fever was observed more frequent in women than in men and this difference was statistically significant ($p < 0,005$).

CONCLUSION

In conclusion, we observed that acute drug-poisoning cases presented a small part of the cases admitted to the emergency service but they might be evaluated as an important component of them (0.64%). Our study showed that the acute drug-poisoning frequency was more in women than in men and suicide-purposed poisoning was the most important cause of the poisonings for both of the gender. According to our study, the risk groups for suicidal poisoning were teens and females. Psychoactive drugs were the most frequently used drugs which were followed by analgesics. The findings in this report may represent an example of the drug-poisonings in a developing country. The data obtained from this study may also represent a useful component of poisoning database to be formed in future and may contribute to the literature by reflecting characteristics of the drug-poisonings in a region with a very high ratio of young population in Turkey. However, definite epidemiological data needs to be verified with either a multicenter study or a central database for all poisoning cases in Turkey.

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