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Demographic and Cost Analysis of Intoxication Cases Admitted to University Hospital Emergency Service Within a Year

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Abstract

Aim: We described the demographic and etiological characteristics of drug-induced intoxication cases who were admitted to the adult emergency department of our hospital between 01.01.2017 and 31.12.2017 and how much they cost to the Social Security Institution.

Materials and Methods: This was descriptive research, and the records of the patients who were admitted to the adult emergency service and diagnosed with drug intoxication between January 01, 2017 and December 31, 2017 were obtained from the automation system and analyzed retrospectively.

Results: The data of 83 patients were evaluated in our study. 63.9% (n=53) of the patients were female and 36.1% (n=30) were male. Intoxications were most common in the 18-24 age group (48.2%; n=40). 92.8% (n=77) of the patients took the drug to commit suicide, and the majority of the intakes (60.2%; n=50) were due to single drug intake. The most common used drugs are antidepressants. The treatment costs increased significantly in the cases of suicidal intake (p=0.038) and multiple drug intake (p=0.035).

Conclusion: Most of the drug-induced intoxications occurred because of suicidal intake. An important part of the drugs used for this purpose are psychiatric drugs. Therefore, the presence of psychiatric symptoms should be investigated in patients diagnosed with drug intoxication, and psychological support should be provided when necessary.

Keywords: Drug intoxication, social security costs, toxins, suicidal intake, and accidental intake

Introduction

Any chemical, physical, or organic substance that is digested, inhaled, absorbed, or injected can damage structures and impair functions due to its chemical effects. When taken in small amounts is called a toxin, and exposure to this substance is called intoxication (1). Intoxication cases are among the most common medical emergencies. Intoxication may occur due to accidental or suicidal intake, occupational exposure, or the effects of a drug that should be regularly used medically (2). While accidental intoxications are observed more frequently under the age of six, suicidal intoxications are more common in the puberty period when mental changes are becoming evident (3). Among emergency service admissions, intoxication is the most common cause of non-traumatic coma in patients younger than 35 (4). It was reported that the intoxication cases that applied to the emergency service only constitute 0.46-1.57% of all emergency service admissions. The causes of intoxication vary based on geographical region, socio-cultural, and economic status. Pharmaceuticals, foods, and industrial and agricultural toxic substances are the most common causes of intoxication (4). In the study Özayar et al. (5) conducted, 87% of the cases were suicidal intoxication; 70.2% occurred due to multiple drug intake, and 29.8% to single drug intake. It was found that multiple drug intake happens primarily due to antidepressant combinations.

Considering this information, we described the demographic and etiological characteristics of drug-induced intoxication cases admitted to our hospital's adult emergency department between

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01.01.2017 and 31.12.2017 and how much they cost to the Social Security Institution.

Materials and Methods

The Type of Research and Participants

The study was planned as descriptive research, and the records of the patients who were admitted to the adult emergency service of Kahramanmaraş Sütçü İmam University Faculty of Medicine Hospital and diagnosed with drug intoxication between Jan 1, 2017, and Dec 31, 2017, were obtained from the automation system and analyzed retrospectively. The demographic characteristics of the patients, such as age, gender, the time of admission to and duration of stay in the emergency service, how the intoxication occurred, the reason why the substance was taken, the drugs, and the groups of drugs that caused the intoxication, whether the intoxication occurred due to the intake of a single type of drug or that of different drugs at the same time (multiple intakes), and the patient's clinical symptoms, prognosis, and total costs were examined.

Inclusion and Exclusion Criteria

All patients aged 18 years and above who applied to the emergency service due to drug intoxication and had no missing demographic, and clinical data in their records were included in the study. Patients under 18 years of age, those with incomplete data in their records, and those with symptoms of another intoxication accompanying the drug intoxication were excluded from the study.

Statistical Analysis

The demographic data of the patients, the type, and the injury clinic were summarized through numbers and percentages. Whether the data conformed to the normal distribution was evaluated by running the Shapiro-Wilk test. Kruskal-Wallis and Mann-Whitney U tests were used for statistical analysis of the mean scores, and Spearman correlation analysis was conducted to determine the correlation. The Statistical Package for the Social Sciences 16.0 package program was used for the analysis. The value of $p<0.05$ was considered statistically significant.

Ethics Committee

The study was performed following the Declaration of Helsinki, and the confidentiality of the patients included in the study was ensured. The Kahramanmaraş Sütçü İmam University Faculty of Medicine of Local Ethics Committee approved this study (decision no: 13, date: 21.03.2018).

Results

The data of 83 patients who were admitted to the adult emergency service due to drug-induced intoxication were evaluated in our study. 63.9% (n=53) of the patients were female and 36.1% (n=30) were male. When the patients were examined according to their age groups, it was observed that the intoxications were most common in the 18-24 age group (48.2%; n=40). It was found that 92.8% (n=77) of the patients took the drug, causing intoxication to die by suicide, and the majority of the intakes (60.2%; n=50) were due to a single drug intake. The demographic data for the patients are summarized in Table 1.

It was revealed that a significant portion of the drugs taken were psychiatric drugs, and among them, antidepressants (33.7%; n=28) constituted the drug group that caused the intoxication most frequently. Analgesics were the second most common drug group that caused intoxication. These drug groups that caused intoxication are summarized in Table 2.

When the patients were evaluated in terms of their treatment costs, it was observed that they increased significantly in the cases of suicidal intake (p=0.038) and multiple drug intake (p=0.035) (Table 3).

It was found that age group, gender, single, or multiple drug intake, and whether the drug intake was suicidal did not significantly affect the duration of hospitalization. It was observed that the mean time of arrival to the hospital after the drug intake was 60 min (minimum=15 - maximum=780), and the wider the time gap between the drug intake and the arrival to the hospital was, the longer the hospital stay was (p=0.008, r=0.289) and the more the treatment cost (p=0.029, r=0.240).

Table 1. Demographic characteristics of the patients

Demographic characteristics	Number	Percentage
Age (year)		
18-24	40	48.2
25-34	22	26.5
35 and higher	21	25.3
Gender		
Male	30	36.1
Female	53	63.9
Type of exposure		
Accidental	6	7.2
Suicidal	77	92.8
Single or multiple intakes		
Single	50	60.2
Multiple	33	39.8

Discussion

Intoxication cases are increasing worldwide day by day (6). this study, conducted with a retrospective design in a university hospital's emergency department, examined the patient's demographic characteristics and costs to the healthcare system. In many studies conducted in our country, drugs are the most common cause of acute intoxication (1). In studies conducted in our country, it is seen that the female gender is more common in poisoning cases, and the mean age is 25 years and below (1,7,8). Our study has revealed similar findings in line with the previous literature. Previous studies have shown that suicide attempts by drug intake in women are significantly more severe than for men in our country (1,9,10). In our study, cases of poisoning were more common in women, and the most common cause of poisoning was suicide attempts. These findings are similar to previous studies.

Table 2. Subgroups of drugs causing intoxication

Subgroups of drugs	Number	Percentage
Analgesic	29	34.9
Antidepressant	28	33.7
Antipsychotic	8	9.6
Narcotic	8	9.6
Antihypertensive	9	10.8
Antiviral	8	9.6
Antiepileptic	7	8.4
Antibiotic	12	14.5
Others	22	26.5

Since multiple drug intake exists, the total rate exceeds 100%

Table 3. Cost analysis of patients

Demographic characteristics	Cost [median (min-max)]	p
Age (year)		
18-24	962.35 (15.50-3907-17)	0.076[a]
25-34	587.27 (75.13-2057.36)	
35 and higher	198.75 (102.36-1828.64)	
Gender		
Male	716.39 (15.50-2497.91)	0.443[b]
Female	532.30 (75.13- 3907.17)	
Type of exposure		
Accidental	130.17 (25.04-1356.36)	0,038[b]
Suicidal	760.79 (15.50-3907.17)	
Single or multiple intakes		
Single	401.35 (15.50-3907.17)	0.035[b]
Multiple	891.12 (104.80-3015.18)	

[a]: It was found through the Kruskal-Wallis test.
[b]: It was found through the Mann-Whitney U test.
min-max: Minimum-maximum

Some studies describe the cost analysis and the influential factors on the cost of intoxication cases in our country, but these studies were not specific to drug-induced intoxication (11,12). To the best of our knowledge, our study is first describing the effect of single- or multi-drug intoxication among only drug intoxication cases admitted to the emergency department. In a previous study, Hakkoymaz et al. (12) found no statistically significant difference in costs according to age groups, gender, and type of medicine in intoxications with a single medicine intake. On the other hand, it is determined that the costs are higher for suicidal poisonings, medicine-induced intoxications, and cases that require intensive care are needed. In addition, it was found that multiple drug intake poisonings were more costly when compared to single drug intake poisonings (12).

While explaining the demographic characteristics and costs of the intoxication cases, we raised awareness in the related literature through the cases with statistical significance. Our study observed that the costs of admissions due to intoxication do not significantly differ in age groups and gender ($p>0.05$). However, we found that the type of exposure and single or multiple intakes were significantly different in terms of cost ($p<0.05$). Although multiple drug intakes are not fatal, clinicians may follow patients for more prolonged, thinking that it will have a challenging course, and therefore the cost may increase. Patient costs increase, especially in suicidal and multiple drug intakes. This situation can be attributed to the reasons such as changes in the follow-up and treatment periods of drugs with different half-lives in multiple intakes, the increase in the possibility of drug interaction, and creating the need for intensive care by producing multiple clinical results.

The cases that were admitted to the emergency service and were between 18-24 (48.2%), female (63.9%), suicidal (92.8%), and single drug intake (60.2%) were the ones most frequently encountered. As for the drug subgroups, it was revealed that the most commonly used ones are antidepressant drugs, which are very common among people. Following the literature, self-medication emerged as the most common cause of intoxication cases (13-15). This result may lead to an argument that as long as they do not harm the prognosis, single agents or agents that do not have synergistic effects in the case of intoxication should be preferred in young women with suicidal tendencies who use psychiatric drugs. Different clinical presentations should bring exposure to the differential diagnosis in intoxication cases into mind (16). The accompanying atypical trauma histories of the patients should not lead to abandoning the suspicion of intoxication (17). When treating such patients, their psychiatric

history can be questioned to prevent drug reactions (18). In this sense, a history of frequent use of psychiatric drugs may be suggestive in terms of exposure or self-harm in any clinical presentation in which the patient was admitted.

Study Limitations

Our study is a single-centre study and was conducted with a limited population of patients, which is a significant limitation. Prospective multicenter studies to be conducted with a broader patient population and in a more limited age group with no comorbid disease may contribute to the literature.

Conclusion

Most of the drug-induced intoxications occurred because of suicidal intake. An essential part of the drugs used for this purpose is psychiatric drugs. Therefore, psychiatric symptoms should be investigated in patients diagnosed with drug intoxication, and psychological support should be provided when necessary.

Ethics

Ethics Committee Approval: The study was approved by the Kahramanmaraş Sütçü İmam University Faculty of Medicine of Local Ethics Committee (decision no: 13, date: 21.03.2018).

Informed Consent: Retrospective study.

Peer-review: Externally and internally peer-reviewed.

Authorship Contributions

Surgical and Medical Practices - Concept - Design - Data Collection or Processing - Analysis or Interpretation - Literature Search - Writing: M.K., H.H., A.İ.

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