Evaluation of poisoning cases that admitted to the emergency department for suicidal ideation

Arife Erdogan

Izmir Bakırcay University, Faculty of Medicine, Cigli Education and Research Hospital, Department of Emergency Medicine, Izmir, Türkiye

Abstract

Aim: In this study, we aimed to evaluate the effects of gender, age, time of admission to the emergency department, season, drug used, the time patients were admitted to the emergency department following the drugs administration, and psychiatric illness history on the clinical outcome of patients by examining the patients who admitted to our emergency department after taking suicidal drugs.

Materials and Methods: The data of the study were obtained as a result of the retrospective examination of the cases who took drugs for suicidal purposes, who admitted to the emergency department of our hospital between January 2019-January 2020. We divided those who were discharged and admitted to the ward as good clinical outcome, and those who were admitted to the intensive care unit and those who died had poor clinical outcome. We statistically analyzed the effects of age, gender, the active substance used, the time of admission to the emergency department, the number of hours after which it was presented, a previous suicide attempt, and a history of psychiatric illness on clinical outcomes.

Results: 295 patients were included in the study. 64.4% (190) of the cases were female and 35.6% (105) were male. The mean age of the patients is 32.9, and the majority of them are in the 25-34 age group (31.5%). The fact that the patients were male, admitted to the emergency room 4 hours after taking the drug, admitted to the emergency room between 00.00-07.59, committed suicide with psychiatric medication, had a previous suicide attempt and diagnosis of psychiatric illness, had a statistically poor clinical outcome (p<0.001).

Conclusion: As a result, the history of the patients, the active substances they took, the hours and duration of their arrival to the emergency department can be used to predict the occurrence of serious clinical pictures in suicidal drug intake.

Introduction

Intoxication is one of the important medical and social problems today. It usually occurs as a result of taking high doses of drugs or substances with suicidal intentions or unconsciously [1]. Suicide is a deliberate act of anger and self-harm directed towards one's own self [2]. Suicide cases account for approximately 95% of all poisoning cases. It usually occurs with medical drugs, recreational substances, household-industrial and agricultural toxic substances [3]. Mortality increases especially with substances taken for suicidal purposes, and it is estimated that 300,000 people die annually due to this reason [4]. According to the results of the few epidemiological studies conducted in our

country, the annual incidence of poisoning was found to be 0.8-5% [5]. There has been a dramatic increase in the incidence of poisoning cases in recent years. Poisonings constitute 0.5-2.1% of all emergency department admissions in our country [6].

Increasing cases of suicidal poisoning create both an important health problem and a socioeconomic problem in terms of public health [7]. 5-14% of intensive care unit beds are used for poisoning cases [8]. Acute poisonings have high morbidity and mortality rates. For this reason, if a possible acute poisoning is suspected in the evaluation of the patients who apply to the emergency department, it is important that the diagnosis and treatment are carried out quickly [9]. Serious complications may arise depending on the drug used and the time required to reach the hospital. Considering this, in the approach to suicide cases, it is

*Corresponding author:
Email address: arife.erdogan@yahoo.com (Arife Erdogan)

necessary to know clearly the demographic characteristics, the time of admission to the hospital, the substances taken and the previous psychiatric disease history. After the first intervention, life support is provided to the patients without wasting time in the intensive care units, the poisoning agent is determined and a specific treatment is applied to this poisoning agent.

In this study, we aimed to contribute to the poisoning data of our country by examining some demographic and clinical characteristics of poisoning cases admitted to the emergency department of our hospital due to suicide attempt and evaluating their effects on mortality retrospectively.

Materials and Methods

In this study, the files of patients aged 18 years and over who applied to our hospital Emergency Department between January 2019 and December 2019 due to taking drugs for suicidal purposes were examined retrospectively. All patients meeting the inclusion criteria were included in the study. The patients' age, gender, date and time of admission to the hospital, the number of pharmacological agents and drugs they took, the time they were admitted to the emergency department following the drug's administration, previous suicide attempt, diagnosis of psychiatric disease, and clinical outcomes were all evaluated. The clinical outcomes of the patients were divided into good and poor. Those who were discharged from the emergency department and admitted to the service were accepted as good, and those who were admitted to the intensive care unit and those who died were considered to have a poor clinical outcome. The effects of variables on mortality and clinical outcomes were evaluated statistically.

Statistical analysis

Data were evaluated in the statistical package program IBM SPSS Statistics 28.0 trial version (IBM Corp., Armonk, New York, USA). The conformity of the data of continuous variables to the normal distribution was evaluated with the Shapiro Wilk test and Q-Q charts. Descriptive statistics were given as frequency (n), percent (%), median (M), 25th percentile (C1), 75th percentile (C3). Kruskal-Wallis and Mann-Whitney U tests were used for comparisons between groups due to continuous variables did not distributed normally. Pearson chi-square, Fisher exact and Fisher Freeman Halton tests were used for categorical data comparisons. Bonferroni correction was applied for pairwise comparisons. A value of $p < 0.05$ was considered statistically significant.

This study was approved by the Izmir Bakircay University Ethics Committee for Non-Interventional Clinical Trials (Approval no: 2021/282).

Results

295 patients were included in the study. 64.4% (190) of the cases were female and 35.6% (105) were male. The mean age of the patients is 32.9, and the majority of them are in the 25-34 age group (31.5%). Sociodemographic characteristics of the patients are shown in Table 1.

29 patients (9.8%) were discharged from the emergency department, 172 (58.2%) were admitted to the service, 74

Table 1. Sociodemographic characteristics.

Sex	Number (n)	Percent (%)
Female	190	64.4
Male	105	35.6
Age		
18-24	88	29.8
25-34	93	31.5
35-49	83	28.1
50-65	28	9.4
66<	3	1.01

Table 2. Emergency room admission hours.

Emergency room admission hours	Good clinical outcome Number (percentage)	Bad clinical outcome Number (percentage)
1	84 (42.0%)	2 (2.2%)
2	54 (27.0%)	9 (9.7%)
3	35 (17.5%)	14 (15.1%)
4	21 (10.5%)	32 (34.4%)
5	1 (0.5%)	13 (14.0%)
6	5 (2.5%)	20 (21.5%)
7	0 (0.0%)	3 (3.2%)

(25%) were admitted to the intensive care unit, 20 (6.7%) died in the emergency department.

While 145 (72.1%) of the female patients had a good clinical outcome, 45 (47.9%) had a bad clinical outcome, 56 (27.9%) of the male patients had a good clinical outcome and 49 (52.1%) had a poor clinical outcome. As a result, it was found that male gender was statistically significant for poor clinical outcome ($p < 0.001$). 70% (14) of the patients who had exitus were male patients.

When we look at the duration of admission to the hospital after taking the medication, 29.1% of the patients admitted to the emergency department in the first hour, 50.5% in the 1-2 hours range, and only 3 patients admitted to the emergency room 7 hours later. It was observed that 73.1% of the patients with poor clinical outcome applied to the emergency department 4 hours or more after taking the drug. It was observed that 97% of the cases with good clinical outcome presented to the emergency department in the first 4 hours (Table 2).

When the seasonal distribution of the patients' admissions to the emergency department was analyzed, 120 patients (40.6%) were admitted in winter, 48 patients (16.2%) in autumn, 69 patients (23.3%) in summer and 58 (19.6%) in spring. Although the most cases were seen in the winter season, there was no statistically significant difference between the seasons in the poor clinical outcome (p=0.329).

We evaluated the drugs they took in terms of the causative groups and found that the most commonly taken drugs were psychiatric drugs, antibiotics, nonsteroidal antiinflammatory drugs (NSAIDs), paracetamol, antihypertensive drugs, neurologic, antiepileptic, gastrointestinal system (GIS), acetyl salicylic acid (ASA). When the relationship between the active substances used and poor clin-

Table 3. Drugs that cause poisoning.

Medication Taken	Clinical Outcome		p
	Good	Poor	
Antibiotic			
No	131 (65.2%)	71 (75.5%)	0.074
Yes	70 (34.8%)	23 (24.5%)	
NSAIDs			
No	119 (59.2%)	66 (70.2%)	0.068
Yes	82 (40.8%)	28 (29.8%)	
Psychiatric			
No	148 (73.6%)	35 (37.2%)	<0.001
Yes	53 (26.4%)	59 (62.8%)	
Antihypertensive			
No	184 (91.5%)	87 (92.6%)	0.767
Yes	17 (8.5%)	7 (7.4%)	
Neurological			
No	193 (96.0%)	82 (87.2%)	0.005
Yes	8 (4.0%)	12 (12.8%)	
Paracetamol			
No	188 (93.5%)	70 (74.5%)	<0.001
Yes	13 (6.5%)	24 (25.5%)	
Antiepileptic			
No	198 (98.5%)	92 (97.9%)	0.655
Yes	3 (1.5%)	2 (2.1%)	
GIS			
No	189 (94.0%)	85 (90.4%)	0.262
Yes	12 (6.0%)	9 (9.6%)	
ASA			
No	195 (97.0%)	83 (88.3%)	0.003
Yes	6 (3.0%)	11 (11.7%)	

*p < 0.05 statistically significant.

Table 4. Clinical feature histories of the patients.

Previous suicide attempt			
No	190 (94.5%)	68 (72.3%)	<0.001
Yes	11 (5.5%)	26 (27.7%)	
Diagnosis of psychiatric disease			
No	163 (81.1%)	33 (64.9%)	<0.001
Yes	38 (18.9%)	6 (35.1%)	

*p < 0.05 statistically significant.

ical outcome was examined, it was found statistically significant in psychiatric, neurologic, paracetamol and ASA patients who committed suicide (p<0.001) (Table 3).

It was observed that the time of application to the emergency department of the cases was mostly between 16.00-23.59 hours. 73 people (24.7%) admitted to the emergency room between 08.00-15.59, 154 people (52.2%) be-

tween 16.00-23.59, 68 (23%) between 00.00 and 07.59. It was found that the patients who applied to the emergency department between 00.00-07.59 hours had a statistically significant outcome with poor clinical outcomes (p<0.001).

When the patients were examined in terms of having attempted suicide before, it was found that 37 cases (12.5%) had attempted suicide before. The clinical results of 26 of them were poor and statistically significant (p<0.001) (Table 4). Similarly, 6 of 44 cases with a history of psychiatric illness had a poor clinical outcome and were found to be statistically significant (Table 4).

Discussion

Poisoning cases are among the most important cases of emergency department. They are very common cases that require a serious approach and respond well to timely treatment [10]. Suicidal poisoning is a very common public health problem and is among the top ten most common causes of death in developed countries, according to WHO data. It has been observed that the frequency of suicide-related deaths has increased in young adults in recent years [11,13]. In our study, we found that the most cases (31.5%) were between the ages of 25-34. In some other studies, it has been shown that the most common cases are between the ages of 18-24 [14,15]. In particular, identifying the problems that lead individuals in these periods to commit suicide and supporting these individuals will be beneficial in terms of preventing suicide.

Studies have indicated that being a woman is a risk factor for suicide [14,16]. In our results, similar to the literature, 64.4% of the cases were female patients. This may be attributed to the fact that women in developing countries attempt suicide because they cannot find a way out, due to social pressure on them and the lack of a voice in their own lives. Women may choose suicide attempt as a way to express their distress and reactions to others [17]. There are studies in the literature showing that suicide cases resulting in death are higher in males [18, 19]. Similarly, we saw that most of the cases that resulted in death were men. The fact that men seek less help, act more impulsively and use more lethal methods, and have higher alcohol/substance use may be associated with higher rates of death in suicide attempts [19].

The hospitalization rate of patients who admit to the emergency department of our hospital is 83.2%. When other studies were examined, we found that this rate was between 5.1-64% [20,21]. In terms of mortality, while no death was observed in some studies [22], it was found to be 0.92% and 0.31% in some studies [23,24]. In our study, the mortality rate was 6.7%. We can attribute the reasons for these to the fact that our hospital's emergency department is the 3rd level and therefore bad patients are referred to our hospital because they receive too many referrals from the surrounding hospitals.

Considering the data on the duration of admission to the emergency department after taking the drug, it was seen that the rates of admission in the first 2 hours were 45.2% [25] and 39.3% [26]. Similarly, this rate was found to be 50.5% in our study. The clinical outcome of the patients who applied 4 hours after taking the drug was poor.

For this, patients who applied to the emergency department and who have passed more than 4 hours after taking the drug should be followed more closely and treated more quickly. We could not find any study in the literature showing the relationship between clinical outcome and time to hospital admission.

According to our results, the most applications to our emergency department were between 16.00-23.59 hours. It is similar to other studies [27]. Patients admitted between 00.00 and 07.59 hours had high rates of mortality and poor clinical outcome. The fact that the cases are mostly concentrated in the evening shows the hours of communication with the individuals they live with. The reason for this suggests that the purpose of suicide may not be to die but to call for help. Suicide attempts are less common at night and in the morning when everyone is asleep. We can say that the mortality of suicide attempts made during these hours is higher. Therefore, it is necessary to be more careful about the cases that admit at that time.

Studies have shown that there is no relationship between suicide attempt and seasons, only a slight increase in spring and autumn [25,26,28]. According to our results, it was seen that the most cases were in the winter season. But the seasons had no effect on the patients' poor clinical outcome.

Although the agents of drugs taken for suicidal purposes differ according to countries, it is known that mostly medical drugs are used [29]. Antidepressants and analgesics were mostly used in studies conducted in our country [16,23,30,31]. Similarly, in our results, it was found that antidepressants and analgesics were mostly used. One of the reasons for this is that some of the NSAIDs and antidepressants are more easily accessible as a result of their over-the-counter and widespread use. At the same time, the fact that these patients use antipsychotic or antidepressant drugs due to their psychiatric problems and their use of these drugs in suicide attempts may be another reason. In addition, we showed in the study that the clinical outcome of patients who used psychiatric drugs for suicidal purposes was poor. Therefore, it is useful to approach the cases who commit suicide with such drugs more carefully.

It is known that suicide attempts are high in depressive patients and these patients generally attempt suicide with their own medication. Studies conducted on this subject have shown that the cases that make up 50% of suicide attempts are patients with pre-existing psychiatric problems [32,33]. Supporting all these, we found that the clinical outcomes of our patients with a diagnosis of psychiatric disease and a previous suicide attempt were statistically poor.

Conclusion

The results of our study are in agreement with the general literature information. Although female cases are more common, male cases should be approached more carefully because of the worse clinical outcome of male cases. It should be kept in mind that the clinics of the patients who admit 4 hours after taking the drug and apply during the night and early morning hours are worse. The clinics of patients with a previous suicide attempt and a diagnosis of psychiatric disease are worse. Considering that

patients mostly prefer antidepressants and analgesics as suicide methods, these drugs should be prescribed more carefully in cases with suicidal ideation and risk. Therefore, close follow-up of this group of patients and taking preventive measures are important.

Ethics approval

References

1. Gambassi F, Botti P, Ieri A, et al. Toxicologic related deaths: A case series from 1970 to 2014. Clin Toxicol. 2015;53(4):263.
2. Klonsky D.E., May M.A., Saffer B.Y. Suicide, Suicide Attempts, and Suicidal Ideation, Annu. Rev. Clin. Psychol. 2016;12:307–30.
3. Ayaz T, Bilir Ö, Ersunan G, et al. İntihar Amaçlı İlaç Zehirlenmelerinin Değerlendirilmesi. Konuralp Tıp Dergisi 2015;7:53–6.
4. Gunnell D, Eddleston M. Suicide by intentional ingestion of pesticides: a continuing tragedy in developing countries. Int J Epidemiol 2003; 32(6): 902-9.
5. Göksu S, Yıldırım C, Kocaoğlu H, et al. Characteristics of acute adult poisoning in Gaziantep, Turkey. J Toxicol Clin Toxicol 2002; 40(7): 833-7.
6. Beydın A, Erenler A. Zehirlenmenin Değerlendirilmesi ve Zehirlenmelere Genel Yaklaşım; Şahinoğlu H, Dilek A, Kaya A, Yoğun Bakım Sorunları ve Tedavileri.3. Baskı, Nobel Kitapevi, 2011:411-5.
7. Çetin N.G., Beydilli H, Tomruk Ö. Acil servise başvuran intoksikasyon olgularının geriye dönük analizi., Isparta Süleyman Demiral Üniversitesi Tıp Fakültesi Dergisi 2004; 11(4):7-9.
8. Richard S. Irwin, James M. Rippe. Farmakoloji, Doz Aşımı ve Zehirlenmeler. In: Irwin ve Rippe'nin Yoğun Bakım Tıbbı (6rd ed) 2014, (Çeviri Ed: Tulunay M, Cuhruk H). Güneş Tıp Kitapevleri: Ankara; 2014 pp. 1433.
9. Wax P.M. "History," In: L. R. Goldfrank and N. E. Flomenbaum, Eds, Toxicologic Emergency, 6th Edition, McGraw-Hill, New York, 2006, pp. 1-14.
10. Eray O, Tunçok Y. Zehirlenen hastaya yaklaşım. Türkiye Klinikleri Farmakoloji Dergisi 2003; 1 (1): 36-40.
11. Mgaya E, Kazaura RM, Outwater A, Kinabo L. Suicide in the dar es salaam region, Tanzania, 2005. J Forensic Leg Med 2007; 30: 2-5.
12. Yüksel N. İntiharın Nörobiyolojisi. Klinik Psikiyatri Dergisi. 2001; 4: 5-15.
13. Dilsiz A, Dilsiz F. İntihar girişimlerinde belirtilen nedenler. Kriz Dergisi 1993; 1: 124- 129.
14. Kerkhof AJFM, Arensman E. Attempted suicide and deliberate self harm epidemiology and risk factors. Gelder MG, Lopez JJ, Andreasen N (ed). Ne Oxford Text Book of Psychiatry First ed. Leiden University Press and World Healt Organization, 2000: 1039-1045.
15. Atli, A., Uysal, C., Kaya, M.C., et al. Acil ünitesine intihar girişimi nedeniyle başvuran olguların değerlendirilmesi: Şanlıurfa örneklemi. Journal of Mood Disorders, 2014;4, 110-114.
16. Köse I, Zinciroğlu Ç, Şenoğlu N, et al. Yoğun bakım ünitemize kabul edilen zehirlenme olgularının bir yıllık geriye dönük incelemesi ve mortaliteyle ilişkili faktörlerin değerlendirilmesi. Tepecik Eğit.ve Araşt. Hast. Dergisi 2015; 25: 28-32.
17. Beautrais AL, Joyce PR, Mulder RT. Personality traits and cognitive styles as risk factors for serious suicide attempts among young people. Suicide and Life-Threatening Behaviour, 1999; 29: 37–47.
18. Chehil S, Kutcher S. Suicide risk managment: Wiley Online Library. 2012.
19. Doshi A., Boudreaux E. D., Wang N., et al. National study of us emergency department visits for attempted suicide and self-inflicted injury, 1997-2001. Annals of emergency medicine, 2005;46(4), 369-375.
20. Serinken M, Yanturalı S. Acil serviste intihar amaçlı zehirlenmelerin geriye dönük analizi. Toksikoloji Dergisi 2003; 1(1): 15-9.
21. Buchanan WJ. A year of intentional self poisoning in Christchurch. N Z Med J 1991; 104 (923): 470-72.

22. Tas N, Yagan O, Yancar E, et al. Retrospective analysis of the intoxication cases followed in an intensive care unit. J. Exp. Clin. Med., 2015; 32: 51-54.

23. Özayar E, Değerli, Güleç H, et al. Yoğun Bakıma Kabul Edilen Zehirlenme Olgularının Retrospektif Analizi. Yoğun Bakım Derg 2011; 3: 59-62.

24. Yağan Ö, Akan B, Erdem D, et al. The retrospective analysis of the acute poisoning cases applying to the emergency unit in one year. Şişli Etfal Hastanesi Tıp Bülteni 2009; 43: 60-4.

25. Karcıoğlu Ö, Demirel Y, Esener Z, et al. Acil Serviste ilaç ile Zehirlenmeler: Bir Yıllık Olgu Serisi. Acil Tıp Dergisi 2002;2(2):26-33.

26. Ok G, Erbüyün K, Mirzai T, Vatansever D, Tok D. Acil servise başvuran zehirlenme olgularının retrospektif olarak incelenmesi. Toksikoloji Dergisi 2006; 4(3-4): 5-9.

27. Dilbaz N., Şengül C.B., Çetin M.K., et al. Genel bir hastanede intihar girişimlerinin değerlendirilmesi. Kriz Dergisi, 2005,13, 1-10.

28. Kaplan, H.I. & Sadock, B.J. (1998). Psychiatric emergencies. In Kaplan HI, Sadock BJ (Eds.). Kaplan and Sadock's Synopsis of Psychiatry, (8th ed.). (pp.864-872): Williams & Wilkins, Baltimore.

29. Müller D, Desel H. Common causes of poisoning: etiology, diagnosis and treatment. Deutsches Ärzteblatt Int. 2013; 110: 690-700.

30. Duran M, Uludag O, Yuzkat N. Analysis of adult intoxication cases treated in ICU: A sample from Adıyaman Region of Turkey. Medical Science and Discovery, 2016; 3: 71-5.

31. Dağlı R, Kocaoğlu N, Bayır H, et al. Yoğun Bakım Servisimizdeki İntoksikasyon Vakalarının İncelenmesi. Muğla Sıtkı Koçman Üniversitesi Tıp Dergisi 2016; 3: 17-20.

32. Beskow J. Depression and suicide. Pharmacopsychiatry 1990; 23:3-8. http://dx.doi.org/10.1055/s-2007-1014522.

33. Cheng AT. Mental illness and suicide. A case-control study in East Taiwan. Arch Gen Psychiatry 1995;52:594-603 http://dx.doi.org/10.1001/archpsyc.1995.03950190076011.