ORIGINAL ARTICLE

CYPRUS
JOURNAL OF MEDICAL SCIENCES

DOI: 10.4274/cjms.2020.1827
Cyprus J Med Sci 2022;7(1):48-52

A Retrospective Evaluation of Suicidal and Accidental Drug Intoxication in Intensive Care Unit

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Abstract

BACKGROUND/AIMS: We reviewed the demographic characteristics, causes, and prognosis of intoxication cases admitted to the intensive care unit over 3 years.

MATERIALS AND METHODS: The records of patients treated for intoxication in medical and surgical intensive care unit in January 2015–December 2017 were retrospectively reviewed. Age, gender, intoxicating drug, length of intensive care unit stay, need for mechanical ventilation, need for hemofiltration, and prognosis were evaluated.

RESULTS: A total of 3,252 patients were admitted to the intensive care unit during the study period, 202 (6.21%) of whom for intoxication. One hundred fifteen (56.9%) were females and 87 (43.1%) were males. Mean age was 32.8±13.5 years. Suicidal intent was determined in 146 (72.3%) of the cases, while 56 (27.7%) were considered accidental intoxication. The rate of intoxication with suicidal intent was 81.7% (n=71) among females, significantly higher than the rate among males. Need for mechanical ventilation was greater among those with accidental intoxication (32.1%, n=20) compared to those with suicidal intent (13.6%, n=18). The mortality rate was significantly higher among patients who required mechanical ventilation and hemofiltration ($p<0.001$ for both). While the combined drug intoxication was most common (27.7%, n=56), the antidepressants were the most common observed agents alone.

CONCLUSION: Although suicidal intoxication has low mortality and fair prognosis, intoxication cases still occupy a significant portion of intensive care beds.

Keywords: Intoxication, suicidal, drug

INTRODUCTION

Alcohol or drug intoxication is defined by the World Health Organization as major disturbances in consciousness and vital functions because of intentional or accidental exposure to an excessive dose of a psychoactive substance.[1] Acute intoxication is among the most common causes of medical emergencies and places a substantial burden on the health system. A large proportion of the acute intoxication cases presenting to emergency departments are admitted to the intensive care unit (ICU).[2,3] In Turkey, intoxication cases comprise 0.7%–2.4% of the total number of patients presenting to emergency departments.[4,5] Intoxication cases also account for a small percentage of hospital mortalities (2.1%).[6]

In this study, we retrospectively examined the demographic characteristics, causes, and prognosis of intoxication cases admitted to ICU over a period of 3 years.

To cite this article: Şen B, Öztürk İ. A Retrospective Evaluation of Suicidal and Accidental Drug Intoxication in Intensive Care Unit. Cyprus J Med Sci 2022;7(1):48-52

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Received: 19.02.2020
Accepted: 03.05.2020

MATERIALS AND METHODS

The records of patients treated in the training and research hospital department of medical and surgical ICU in the years 2015–2017 were retrospectively reviewed (ethics committee approval number: 2018/0109, date: 10/04/2018). Patients admitted for drug intoxication were evaluated in terms of age, gender, intoxicating drug, comorbidities, length of ICU stay, need for mechanical ventilation, need for hemofiltration, and prognosis.

Statistical Analysis

Statistical analyses were done using Statistical Package for the Social Sciences (SPSS) software version 20.0 (SPSS Inc., Chicago, IL, USA). The data were expressed as mean ± standard deviation or number (n) and percentage (%). Comparisons of numerical data between the two groups were done using Student's t-test, and categorical data were compared using the Pearson chi-square test. $P<0.05$ was considered statistically significant.

RESULTS

A total of 3,252 patients were admitted to our ICU between the dates January 1, 2015 and January 1, 2018. Of these, 202 patients (6.21%) were admitted for intoxication; 115 were females (56.9%) and 87 were males (43.1%). Mean age was 32.8±13.5 years for all patients with intoxication, 33.9±15.5 years for the females and 31.2±10.0 years for the males. The rate of intoxication with suicidal intent was 81.7% (n=71) among females, significantly higher than the rate among males (59.8%, n=52) (p=0.001). Mean length of ICU stay was 2.4±1.4 (1–8) days and showed no difference based on gender. Gender was not significant associated with need for mechanical ventilation or hemofiltration or with outcomes (p=0.133, p=0.432 , p=0.701). General and gender-specific clinical characteristics of the patients and comparisons between the genders are presented in Table 1.

The majority (67.3%) of the patients were followed for 1 or 2 days, while the remaining patients were followed for 3 days or longer. A total of 38 (18.8%) patients required mechanical ventilation, and 18 (8.9%) underwent hemofiltration. The mortality rate was significantly higher among patients who required mechanical ventilation and hemofiltration (p<0.001 for both, Table 2).

Suicidal intent was determined in 146 (72.3%) of the cases, while 56 (27.7%) were considered accidental intoxication. Need for mechanical ventilation was significantly greater among those with accidental intoxication (32.1%) compared to those with suicidal intent (13.6%) (p=0.003). Intent/reason for intoxication was not significantly associated with any other parameters (Table 3). This intoxication was the second suicide attempt for 2 (1.3%) of the patients with suicidal intent, and was the first attempt for the others. Combined drug intoxication was most common (27.7%), with antidepressants being the most common single cause.

DISCUSSION

With increasing numbers of cases worldwide, intoxication has become a major socioeconomic health problem. Intoxication cases are often admitted to emergency departments and require intensive treatment and follow-up. The National Poison Center of Turkey recommends that these patients be followed under ICU.

Our study includes patients with intoxication admitted to the ICU over a period of 3 years. Admissions due to intoxication accounted for 6.21% of all cases admitted to intensive care. In the literature, this rate varies between 4 and 20% for ICUs in Turkey.[2,7,8] Yaylaci et al.[9] reported that intoxication accounted for 8.9% of all cases admitted to the ICU.

The mean age of these patients varies between 25.2±9.9 and 35.5±16.7 years according to other Turkish publications; in our study the mean age was 32.8±13.5 years. Nearly all previous studies have indicated a preponderance of females among cases of intoxication.[4,7-9] Our analysis supported the literature, with women comprising 56.9% of our cases.

In our study, we observed that most of the intoxication were attempts to die by committing suicide, with suicidal intent significantly more common among women than men (81.7% vs. 59.8%). This is consistent with several other studies reporting higher rates of suicidal intoxication among women, at rates ranging from 60% to 77%.[10-13]

Average length of ICU stay due to intoxication varies between 2.7±1.2 and 3.7±2.05 days in the literature. In our study, mean ICU stays were 2.5±1.5 days for suicidal patients and 2.2±0.9 days for patients with accidental intoxication. Mechanical ventilation and hemofiltration were required more frequently by patients admitted for accidental intoxication than those with suicidal intent. Dağlı et al.[14] reported in their retrospective study of 87 patients that only two patients required mechanical ventilation and similarly, Totoz et al.[15] reported that eight of 66 patients needed mechanical ventilation and two underwent hemofiltration. In another study including 65 drug overdose cases, Orsini et al.[16] stated that 77% of the patients required mechanical ventilation. Brandenburg et al.[6] evaluated 7,331 patients in 81 ICUs in the Netherlands and determined an 18.9% rate of mechanical ventilation. Sorge et al.[17] reported rates of 27% for mechanical ventilation and 13.6% for hemodialysis. In this study, rates of mechanical ventilation and hemofiltration were 13.6% and 7.5% among patients admitted for intoxication with suicidal intent versus 32% and 12.5% for those with accidental intoxication, respectively.

Mortality rates were 7.5% for patients with suicidal intent and 14.3% for patients with accidental intoxication. Mortality rates reported in the literature are in the 0.1%–11% range in Turkey

Table 1. General and gender-specific clinical data and gender-based comparisons

Parameter			Total (n=202)	Female (n=115)	Male (n=87)	p-value
Age (years)			32.8±13.5	33.9±15.5	31.2±10.0	0.162
Intent	Suicidal		146 (72.3%)	94 (81.7%)	52 (59.8%)	0.001
	Accidental		56 (27.7%)	21 (18.3%)	35 (40.2%)	
ICU stay (days)			2.4±1.4	2.5±1.5	2.2±1.3	0.284
Mechanical ventilation		Yes	38 (18.8%)	22 (19.1%)	16 (18.4%)	0.133
		No	164 (81.2%)	93 (80.9%)	71 (81.6%)	
Hemofiltration		Yes	18 (8.9%)	11 (9.6%)	7 (8.8%)	0.432
		No	184 (91.1%)	104 (90.4)	80 (91.2)	
Outcome	Discharge Referral Death		153 (75.7%) 30 (14.9%) 19 (9.4%)	85 (73.9%) 19 (16.5%) 11 (9.6%)	68 (78.2%) 11 (12.7%) 8 (9.1%)	0.701

ICU: intensive care unit, n: number.

Table 2. Comparison of mortality rates among patients who did and did not require mechanical ventilation and hemofiltration

	Mechanical ventilation			Hemofiltration		
	Yes	No	p-value	Yes	No	p-value
Discharge	19 (50%)	134 (100%)	<0.001	0 (0%)	153 (97.4%)	<0.001
Death	19 (50%)	0 (0%)		15 (100%)	4 (2.6%)	
Total	38 (100%)	134 (100%)		15 (100%)	157 (100%)	

Table 3. Comparison of parameters between patients with accidental intoxication and intoxication with suicidal intent

Parameter		Suicidal intent (n=146)	Accidental (n=56)	p-value
Age (years)		32.9±14.5	32.5±10.3	0.502
ICU stay (days)		2.5±1.5	2.2±0.9	0.224
Mechanical ventilation	Yes	20 (13.6%)	18 (32.1%)	0.003
	No	126 (86.4%)	38 (67.9%)	
Hemofiltration (yes/no)	Yes	11 (7.5%)	7 (12.5%)	0.623
	No	135 (92.5%)	49 (87.5%)	
Outcome	Discharge Referral Death	111 (76.0%) 24 (16.5%) 11 (7.5%)	42 (75%) 6 (10.7%) 8 (14.3%)	0.851

ICU: intensive care unit, n: number.

and 2.8%–27% globally.[18-20] The rates in our study were higher than the average mortality rates for Turkey but comparable to global data.

Antidepressants predominate among intoxicating agents worldwide, and the situation is no different in Turkey. This is mainly because antidepressants are sold without prescription and most patients who attempt suicide by intoxication are using these medications to treat an underlying depressive mood disorder. Özayar et al.[11] reported that antidepressants were the most common intoxication agents, followed by analgesic anti-inflammatory medicines. In contrast, Dağlı et al.[14] found

that analgesics were more common than antidepressants. Özhasekener et al.[18] also determined intoxication by antidepressants as the most common, whereas Duran et al.[21] found psychoactive drugs to be the common cause. Consistent with the literature, the cases of intoxication in our study most commonly resulted from multiple drug intake, and antidepressant drugs were the most common single agents.

Intoxication is an important health and socioeconomic problem. Its incidence is steadily increasing worldwide. Treatment of these patients is particularly important because most are young and healthy, and full recovery is possible with early response and proper treatment. However, mortality and morbidity are high if the response is delayed. Therefore, individuals with intoxication must be diagnosed immediately upon admission to the emergency department and proper treatment should be initiated without delay. The drug and poison information center in Turkey operates expressly for this purpose; accessible 24 hours a day by phone, the center provides fast and easy access to information about the toxic and fatal doses, clinical symptoms after exposure, treatment, and antidotes for all drugs and poisonous substances. Our hospital also actively receives support from the poison information center; every intoxication case admitted to the emergency department is reported to the center, which provides treatment and follow-up suggestions. After the first response in the emergency department, patients with indications for critical care are admitted to the ICU for treatment. After treatment, psychiatric consultation is provided for patients admitted for suicidal intoxication, and patients are transferred to an institution with a psychiatry inpatient unit if needed.

CONCLUSION

Intoxication is a health problem that mostly affects the young and healthy population, commonly results in admission to emergency departments and requires costly treatment in the ICU. The incidence of suicidal intoxication is rising. Most patients recover after a short follow-up period. However, for some patient's intoxication can be life-threatening and require advanced treatments.

MAIN POINTS

- Intoxication is a frequent health problem that mostly affect young population. It increases the fullness ratio and treatment cost in ICU.
- For some patients' intoxication can be life-threatening and require advanced treatments.
- However, most of the patients recover after a short follow-up period.
- For short follow-up period, there must be an intermediate ICU at all hospitals.

ETHICS

Ethics Committee Approval: This study was approved by Göztepe Training and Research Hospital Ethics Committee (approval number: 2018/0109, date: 10/04/2018).

Informed Consent: Retrospective study.

Peer-review: Externally-peer reviewed.

Authorship Contributions

Concept: B.Ş., İ.Ö., Design: B.Ş., İ.Ö., Supervision: B.Ş., İ.Ö., Data Collection and/or Processing: B.Ş., İ.Ö., Analysis and/or Interpretation: B.Ş., İ.Ö., Literature Search: B.Ş., İ.Ö., Writing: B.Ş., İ.Ö., Critical Review: B.Ş., İ.Ö.

DISCLOSURES

Financial Disclosure: The author declared that this study had received no financial support.

Conflict of Interest: The authors declare no conflict of interest.

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