Original Article

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Evaluation of Poisoning Case Followed in Intensive Care Units: Eskisehir Study

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Abstract

Objectives: In this study, we aimed to retrospectively evaluate poisoning cases followed in tertiary care between 2019 and 2020.

Materials and Methods: 2726 cases followed between January 2019 and December 2020 were reviewed retrospectively. 154 (5.65%) of these cases were identified as poisoning cases. Cases under the age of 18 and chronic poisoning cases were not included in the study.

Results: A total of 154 cases, 87 women and 67 men, were retrospectively analyzed. The mean age of the patients was found to be 37.11 ± 15.7 years. 106 cases were recorded as suicide, 42 cases as accidental and 6 cases as poisoning due to overdose.

Conclusion: The highest poisoning agent was found to be drug. The fact that the cause of poisoning is the highest rate of drugs suggests that issues such as educating the public about drug use, reducing the sale of over-the-counter drugs and not keeping drugs within the reach of everyone should be taken into consideration.

Keywords: poisoning, acute intoxication, intensive care, retrospective study.

Introduction

Poisoning is an event that occurs when a substance that enters the body through oral, inhalation and dermal routes disrupts or stops the functioning of any system in the organism. Intensive care may be required after emergency admission and may cause death depending on exposure[1]. Poisoning is an important global public health problem. According to WHO data, an estimated 193460 people worldwide died from unintentional poisoning in 2012. 84% of these deaths occurred in low- and middle-income countries. In the same year, unintentional poisoning caused more than 10.7 million years of loss of healthy life[2]. According to German data, 178425 poisoning cases were treated in 2016.[3]

About one million people die by suicide each year, and chemicals account for a significant portion of these deaths. For example, deliberate ingestion of pesticides is estimated to cause 370,000 deaths each year. The number of these deaths can be reduced by limiting the availability and access of highly toxic pesticides[4].

As in the whole world, poisoning is a public health problem in our country as well. According to the Turkish Statistical Institute (TUIK), 35% of deaths between the ages of 15 and 34 between 2009 and 2019; On the other hand, 8.3% of the deaths between the ages of 35 and 59 were due to external injury or poisoning[5]. According to the 2020 annual report of the National Poison Center (UZEM), there were 123366 case applications[6].

In this study, we aimed to retrospectively evaluate poisoning patients followed in the intensive care unit in 2019 and 2020.

Materials and Method

2726 cases followed up in the intensive care unit of xxxx between January 2019 and December 2020 were retrospectively analyzed. 5.65% (n=154) of these cases were identified as poisoning cases. Cases under the age of 18 and chronic poisoning cases were not included in the study. All the methods in the study were approved by the Ethical Committee of Eskisehir Osmangazi University (Date: 29/06/2021, #2021-213/37). The study was carried out in accordance with the statement of Helsinki Declaration.

The age, gender, cause and purpose of the poisoning, length of stay in the intensive care unit, month of poisoning, and prognosis of the patients were evaluated. SPSS 21 program was used for statistical evaluation. Data are given as mean ± standard deviation, number or %. Chi-square test was used to compare categorical variables. For statistical significance level, $p < 0.05$ was accepted.

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Table 1. Characteristics of cases.

	Number of Patient (n)	Percentage (%)
Sex		
Female	87	56,5
Male	67	43,5
Type of Explosure		
Accidental	42	27,3
Suicid	106	68,8
Intentional	6	3,9
Route of Explosure		
Oral	142	92,2
Inhale	12	7,8
Group of Poison		
Drug	97	63
Chemical	49	31,8
Natural	5	3,3
Alcohol	3	1,9

Results

The ratio of poisoning cases to all intensive care unit cases (n= 2726) was 5.65% (n=154). 56.5% (n=87) of the cases were female, 43.5% (n=67) were male. 68.8% (n=106) of the cases were poisoned by suicide, 27.3% (n=42) accidentally and 3.9% (n=6) as overdose. 92.2% (n=142) of poisonings occurred by oral route, 7.8% (n=12) by inhalation. The characteristics of the cases are given in Table 1.

In the study, the mean age was 37.1 ± 15.7 (min. 18, max. 83). The mean age of female patients was 33.7 ± 14 years; mean age of male patients was 41.5 ± 16.7 years. Age distribution of the cases is given in Table 2.

It was determined that 55.2% of the men (n = 37) and 79.3% of the women (n = 69) were poisoned by suicide. 65.1% (n=69) of the cases of poisoning with suicidal intent were women; 34.9% (n=37) are male. There was no significant difference between gender and poisoning ($p>0.05$), but the rate of females was found to be significantly higher in poisoning due to suicide ($p<0.05$).

Drugs were found to be the most common cause of poisoning (63%), and 41 patients (42.3%) received a single drug from these drugs, and 56 patients (57.7%) took more than one drug. Agents of poisoning are shown in Table 3, and the list of orally used drugs is shown in Table 4.

Table 2. Age distribution of the cases.

Age	Female	Male	Total
18 - 29	43	19	62
30 - 39	20	16	36
40 - 59	16	22	38
60 +	8	10	18

While the most poisoning cases were detected in summer (57%), the lowest rate (27%) was detected in winter. Drugs as the cause of poisoning were detected at the highest rate in all months, the most in March (n=26) and the least in December (n=3). Case distribution according to seasons is given in Table 5. Due to the change in the intensive care patient profile due to the COVID-19 pandemic, no seasonal comparison was made between the dates examined.

Of these cases, 130 patients (84.5%) were discharged from the intensive care unit, 19 patients (12.3%) were transferred to the service and 5 patients (3.2%) died. The mean hospital stay of the patients is 2.3 days (min 1 day, max 11 days).

Table 3. Agents that cause poisoning.

Agent	Number of Patient (n)	Number of Deaths (n)
NSAID	62	0
Paracetamol	41	0
Antidepressant	40	0
Antipsychotic	26	1
Mushroom	5	0
Organophosphate and pesticides	7	2
Alcohol	3	3
CO	12	0
Other Addictive Substances	31	0

Discussion

Poisoning cases are an important group of patients who require intensive care and follow-up, which can occur both from suicide and accident. Studies in Turkey and around the world have also found that poisoning cases are higher in women (7-9). In our study, it was determined that poisoning cases were more common in women (56.5%).

While the average age was 28.1 years in Yeşiler et al.'s study in 2019 and 27.6 years in Dağlı at el.'s study in 2016, the average age in this study was 37.1 years and 62% of the study participants were between the ages of 18 and 29. (8, 9). The difference may be regional, but the age distribution in our study is consistent with the literature. Studies have reported that suicide events constitute the majority of poisoning cases[10, 11]. Similar results were found in this retrospective study.

Although there are regional differences, drugs were found to be the most common poisoning agent in many studies[7, 12]. Likewise, in our study, drugs were found to be the most common cause of poisoning, and this finding was found to be consistent with the literature. Studies have shown that most of the cases of drug poisoning were analgesics and antidepressants[7, 8]. In our study, similar data were found with the literature.

In studies conducted in Turkey with the same poisoning agent, it was found as 4.5% in Yeşiler et al.'s study, 6.9% in Akköse et al.'s study, and 19.2% in Yağan et al.'s study[8,13,14]. In the United States, 16 out of every 100000 emergency admissions were identified as CO poisoning[15]. This difference may

Table 4. Drugs that cause poisoning

Drug	Number of Patient (n)
Paracetamol	41
Diclofenac	21
Dexketoprofen	17
Sertraline	13
Etodolac	14
Various Antibiotics	13
Quetiapine	5
Duloxetine	12
Naproxen	11
Fluoxetine	9
Flurbiprofen	6
Diazepam	4
Venlafaxine	4
Risperidone	3
Olanzapine	3
Alprazolam	3
Carbamazepine	3
Valproic Acid	2
Aripiprazole	2
Metamizole	2
Gabapentin	2
Propranolol	2
Levothyroxine	2
Acetylsalicylic acid	2
Trifluoperazine	2
Pantoprazole	2
Others*	18
Uncertain	4

*Lithium, Bupropion, Pregabalin, Modafinil, Pinaverium, Clonazepam, Lorazepam, Thiocolchicoside, Montelukast, Levocetirizine, Hydroxyzine, Escitalopram, Ibuprofen, Levetiracetam, Isotretinoin, Mirtazapine, Mianserin, Methylphenidate

be related to the socioeconomic status of the poisoning cases.

The unconscious and careless use of pesticides and organophosphate products is also a major problem in our country. In a study conducted in Pakistan in 2020, the ratio of pesticide and organophosphate poisoning to all poisonings was found to be 65.2%[16]. In Turkey, it has been found at various and lower rates such as 3.2%, 2.7% and 1.15%[13,14,17]. Only 7 cases (4.5%) were recorded in this retrospective study. This situation may be related to the seasonal and geographical characteristics and socioeconomic conditions of the place where the study was conducted.

84.5% of the cases examined in our study were discharged with recovery, 12.3% were transferred to the service and 3.2% died. In studies conducted in Turkey, the rates of cure and discharge were recorded as 96.4% and 98.1%[18, 19]. In a study conducted in Australia in 2017, 74% were discharged[11]. The reason for the difference in discharge rates may be the less exposure of the admitted cases or the shorter application period.

TTable 5. Seasonal distribution of cases.

Season	Number of Patient (n)	Percentage (%)
Spring	42	27,3
Summer	57	37,0
Autumn	28	18,2
Winter	27	17,5

Conclusion

In the study, most of the poisoning cases were found to be suicidal. It was determined that drugs were the most common cause of poisoning. The limitation of the study is that the information accessed is limited due to its retrospective nature. In addition, the change in the intensive care patient profile due to the COVID-19 pandemic in the specified date range made data analysis difficult. The fact that the cause of poisoning is the highest rate of drugs suggests that issues such as educating the public about drug use, reducing the sale of over-the-counter drugs and not keeping drugs within the reach of everyone should be taken into consideration.

References

1. Yeşil O, Akoğlu H, Onur Ö, et al. Acil servise başvuran olguların geriye dönük analizi. Marmara Medical Journal 2008; 21(1): 26-32.
2. WHO. Poisoning Prevention and Management. 2016.
3. Zellner T, Prasa D, Färber E, et al. The use of activated charcoal to treat intoxications. Dtsch Arztebl Int 2019; 116: 311–7.
4. Dawson AH, Eddleston M, Senarathna L, et al. Acute human lethal toxicity of agricultural pesticides: a prospective cohort study. PLoS Med 2010;7(10):e1000357.
5. Turkish Statistical Institute. Adult Mortality Due to Extrinsic Injury and Poisoning, Statistics Data Portal. Publication Date: 06/08/2020.
6. Turkish National Poison Center Annual Report. https://hsgm.saglik.gov.tr/depo/kurumsal/yayinlarimiz/Raporlar/Uzem/UZEM_Ayrintili_Faal_Ek_f8b2cc15-f605-4953-95f1-9733b621c662.pdf
7. 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.
8. Yeşiler Fİ, Şendur ÜG, Demiroğlu Gİ. Yoğun Bakım Ünitesinde Akut İntoksikasyon Vakalarının İncelenmesi. Aegean J Med Sci 2019; 1:14-18.
9. Dagli R, Kocaoglu N, Bayir H, et al. Yoğun Bakım Servisimizdeki İntoksikasyon Vakalarının İncelenmesi. Medical Journal of Mugla Sitki Kocman University 2016;3(1):17-20.
10. Aydın A. Yoğun Bakım Ünitesinde Takip Edilen Zehirlenme Olgularının Değerlendirilmesi: Retrospektif Çalışma. Firat Med J 2019; 24(3): 129-33.
11. Athavale V, Green C, Lim KZ, et al. Characteristics and outcomes of patients with drug overdose requiring admission to Intensive Care Unit. Australas Psychiatry. 2017;25(5):489-493.

12. Müller D, Desel H. Common causes of poisoning: etiology, diagnosis and treatment. Dtsch Arztebl Int. 2013;110(41):690-700.

13. Akkose S, Bulut M, Armagan E, et al. Acute poisoning in adults in the years 1996-2001 treated in the Uludag University Hospital, Marmara Region, Turkey. Clin Toxicol (Phila). 2005;43(2):105-109.

14. 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.

15. Rose JJ, Wang L, Xu Q, et al. Carbon Monoxide Poisoning: Pathogenesis, Management, and Future Directions of Therapy. Am J Respir Crit Care Med. 2017;195(5):596-606.

16. Abubaker Z, Nisar M, Jamshed A, et al. A Retrospective Analysis on Poison Related Mortalities in a Tertiary Care Centre in Pakistan. Asia Pacific Journal of Medical Toxicology 2020; 9(3), 85-90.

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

18. Destegül D, Çapar A. Kayseri Eğitim ve Araştırma Hastanesi anestezi yoğun bakım ünitesinde takip edilen akut zehirlenme vakalarının değerlendirilmesi. Türkiye Klinikleri J Anest Reanim 2018; 16: 8-13.

19. Demir G, Eren GA, Hergünsel O, et al. Yoğun bakım ünitemizde 2003-2007 yılları arasında takip edilen zehirlenme olgularının geriye dönük analizi. Bakırköy Tıp Dergisi 2008; 4: 139-43.