

The Analysis of Poisoning Cases Presented to the Emergency Department within a One-Year Period

Acil Servise Başvuran Bir Yıllık Zehirlenme Olgularının Analizi

Fatma SARI DOĞAN,¹ Vehbi OZAYDIN,¹ Behcet VARISLI,² Onur INCEALTIN,¹ Zeynep OZKOK¹

¹Department of Emergency Clinic, Medeniyet University Goztepe Training and Research Hospital, Istanbul;

²Department of Emergency Services, Van Training and Research Hospital, Van

SUMMARY

Objectives

Intoxication is the emergence of unwanted signs and symptoms in an organism after exposure to potentially harmful chemical, physical or organic materials. In our study, we evaluated demographic and etiological factors of adult patients admitted to the emergency department with suicidal or accidental poisoning.

Methods

This study was conducted retrospectively by using data from the forensics books, protocol notebooks and patient files. Patients over the age of 14 years that were admitted to the Goztepe Training and Research Hospital during a 1-year period (September 2011-September 2012) with poisoning were included in the study.

Results

A total of 430 patients were included in the study and 278 of those patients were females (64.7%). The male/female (F/M) ratio was 1.82/1 and the mean age of the patients was 27.4±11.75 years. The analyses showed that in 348 patients (80.93%) the cause of poisoning was medicine, in 39 patients (9.06%) alcohol and drugs, in 37 patients (8.6%) rat poison, in 4 patients (0.93%) a caustic substance and organophosphates in 2 patients (0.46%). The highest rate of admittance due to poisoning was seen in July, followed by August and September. When the frequency of admittance was evaluated in terms of seasons: summer had the highest frequency with 35.6%, then autumn with 29.1%, spring with 19.8% and winter with 15.6%.

Conclusions

The results of our studies are similar to previously reported studies in Turkey. Poisoning cases are more common in women and the most common way of poisoning is by medication. Unlike previous reports from the literature, we found that poisoning was most frequent in the summer.

Key words: Emergency services; poisoning; suicide.

ÖZET

Amaç

Zehirlenme potansiyel olarak zarar verebilen herhangi bir kimyasal, fiziksel veya organik maddeye maruziyet sonrası organizmada bazı istenmeyen belirtiler ve bulguların ortaya çıkmasıdır. Biz bu çalışmamızda intihar amaçlı veya kazara zehirlenme nedeniyle acil servisimize başvuran erişkin hastaların demografik ve etiyolojik faktörlerini araştırdık.

Gereç ve Yöntem

Çalışma geriye dönük bir çalışma olup veriler adli defter, protokol defteri ve hasta dosyalarından elde edilmiştir. Bir yıllık süre içerisinde (Eylül 2011-Eylül 2012) Goztepe Eğitim ve Araştırma Hastanesi'ne zehirlenme ile başvuran 14 yaş üstü hastalar çalışmaya dahil edildi.

Bulgular

Çalışmaya toplam 430 hasta dahil edildi. Olguların 278'i kadın (%64.7), 152'si erkekti (%35.3). Kadın/erkek (K/E) oranı 1.82/1, yaş ortalaması 27.4±11.75 idi. Zehirlenme nedeni incelendiğinde; 348'inin (%80.93) ilaç, 39'unun (%9.06) alkol ve ilaç, 37'sinin (%8.6) fare zehiri, dördünün (%0.93) kostik madde, ikisinin (%0.46) organofosfat olduğu görüldü. En yüksek başvurunun sırasıyla temmuz, ağustos, eylül aylarında olduğu görüldü. Mevsimlere göre başvuru sıklığına bakıldığında %35.6 yaz, %29.1 sonbahar, %19.8 ilkbahar ve %15.6 kışın başvuru olduğu tespit edildi.

Sonuç

Çalışmamızın sonuçları literatürde Türkiye'de daha önce yapılan çalışmalarla benzerlik göstermektedir. Zehirlenme olguları kadınlarda daha sık olup en sık ilaç alımı yolu ile olmaktadır. Literatürden farklı olarak en sık yaz mevsiminde zehirlenme tespit edildi.

Anahtar sözcükler: Acil servis; zehirlenme, intihar.

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Correspondence: Dr. Fatma Sarı Doğan. İstanbul Goztepe Eğitim ve Araştırma Hastanesi, Fahrettin Kerim Gökay Cad., Kadıköy, İstanbul, Turkey.

e-mail: fatmasdogan@gmail.com



Introduction

Intoxication is the emergence of unwanted signs and symptoms in an organism after exposure to potentially harmful chemical, physical or organic materials.^[1,2] The poisoning can be unintentional (accidental) or intentional (suicide). Early diagnosis, identification of substance that caused intoxication and early treatment are important for good prognosis.

Poisoning cases can vary according to type of exposed poisonous substances, method of poisoning, demographic characteristics of the country and even regions within the same country. In this study we aimed to contribute to the literature by determining the demographic and etiologic features of patients admitted to our emergency department with poisoning in a 1-year period.

Materials and Methods

All patients over the age of 14 years that were admitted to Goztepe Training and Research Hospital Adult Emergency Department due to acute poisoning within a one-year period (between 01.09.2011 and 01.09.2012) were included in the study. Children under the age of 14 are not assessed in the adult emergency department and therefore were excluded from the study. The data was obtained and recorded by retrospectively analyzing protocol and forensic books.

Goztepe Training and Research Hospital Research Assessment Commission approved our study (decree # 22/e from 17/05/2012). Patients' age, gender, chronic diseases, diagnosed psychiatric conditions, previous suicide attempts, causes of poisoning, the time of admission after the medication intake, the reason for medication intake, examination findings, follow-up time, admission time (in terms of months), discharge from emergency department or hospitalization status were investigated.

The SPSS (Statistical Package for Social Science) 17.0 program was used for statistical analyses. Descriptive statistical methods (mean, standard deviation, frequency, percentage) were used for evaluation of the data. The 95% confidence interval and p-value <0.05 were considered statistically significant.

Results

A total of 55,752 patients applied to the emergency department within a 1-year period. Four-hundred thirty (0.77%) patients presented to the emergency department with acute poisoning. Among those patients, 278 were females (64.7%). The female/male (F/M) ratio was 1.82/1. According to this ratio, poisoning was significantly more common in females than males ($p < 0.05$) in this study. The average age of female

patients was 25.15 ± 9.56 years, while that of male patients was 31.39 ± 4.14 years. The mean age of poisoned patients was 27.4 ± 11.75 years (minimum 14, maximum 90). The age and gender distribution of poisoned patients is given in Table 1.

The causes of poisoning included the following: 348 patients (80.93%) due to medication, 39 patients (9.06%) from alcohol and medication, 37 patients (8.6%) ingested rodenticides, 4 patients (0.93%) took a caustic substance and 2 patients (0.46%) consumed organophosphates (Figure 1). Among the patients that were poisoned due to medication intake, 106 patients (24.7%) took multiple medications, 102 patients (23.7%) took antidepressants, 66 patients (15.3%) took non-steroidal analgesics, 24 patients (5.6%) took acetylsalicylic medicine, 19 patients (4.4%) took antibiotics, 8 patients (1.9%) took antiepileptics and 23 patients (5.34%) used other medications.

According to the statistical evaluation of poisoning causes, medication related poisoning was significantly more common than any other reason ($p < 0.05$). There was no significant difference in terms of causes of poisoning between male and female patients ($p = 0.062$).

We also determined that among our patients, 293 (91.2%) did not have continuous medication use, while 38 patients (8.8%) used at least one medication continuously. In addition, 36 out of 430 patients (8.4%) had a chronic disease,

Table 1. Distribution according to age and gender

| | n (%) | |
|---------------------|------------------|------------------|
| Gender | | |
| Women | 278 (64.7) | |
| Men | 152 (35.3) | |
| Age (Mean \pm SD) | 27.4 \pm 11.75 | Min./Max.: 14/90 |

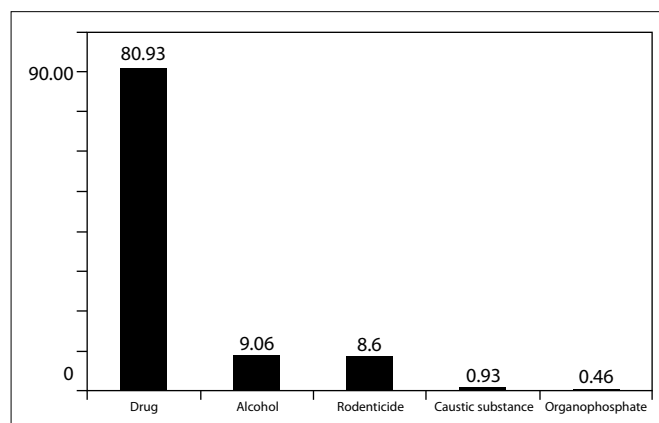


Figure 1. Distribution according to the reason for poisoning.

while 394 patients (91.6%) did not have any chronic disease.

When we investigated whether poisoning cases in our study were diagnosed with psychiatric illnesses we determined that 372 patients (86.5%) did not have any psychiatric illness, while 58 patients (13.5%) were diagnosed with a psychiatric illness. We also determined that 115 out of 430 patients (26.7%) had previously attempted suicide.

Investigation of the time passed between poison intake and emergency department application showed that 237 patients (55.1%) applied to the hospital within the first three hours after intake of the poisoning substance, while for 41 patients (9.5%) it took 3-6 hours, and for 55 patients (12.8%) it took more than 6 hours. We could not obtain information about the time passed between poison intake and emergency department application for 97 patients (22.6%).

Three hundred and seventy nine of the acute poisoning patients (88.1%) poisoned themselves as an attempt of suicide, while 51 patients (11.9%) were poisoned accidentally.

The admission examinations of poisoning cases determined that physical examination was normal in 373 patients (86.7%) and neurological examination was normal in 371 patients (86.1%). Moreover, the requested laboratory tests were normal for 390 patients (90.7%).

Nine out of 430 patients (2.09%) were intubated in the emergency department. Six of the intubated patients were poisoned as a result of multiple medication intake, while 3 of them were poisoned due to antidepressant intake. The time between the poison intake and hospital admission was over 6 hours.

While 204 out of 430 patients (47.4%) were discharged from the emergency department, 226 patients (52.6%) were hospitalized for treatment and follow up. Evaluation of the follow-up time at the emergency room showed that 81 out of 430 patients (18%) were followed for 0-6 hours, 32 patients (7.4%) for 6-12 hours, 22 patients (5.1%) for 12-24 hours and 187 patients (43.5%) for followed for more than 24 hours. We

couldn't reach the information regarding the follow-up time of 108 patients (25.1%).

The distribution of emergency department admittance due to poisoning in terms of months is shown in Figure 2. The highest admittance rate was detected in July followed by August and September. When the admittance frequency was evaluated in terms of seasons, summer had the highest frequency of emergency department admittance due to poisoning with 35.6%, followed by autumn (29.1%), spring (19.8%) and winter (15.6%). The frequency of emergency department admittance due to poisoning was significantly higher in summer ($p=0.000$).

There was no significant difference in terms of causes of poisoning between the seasons ($p=0.310$).

Discussion

Although poisoning cases constitute only 1-2% of all emergency cases, such cases are important because they require early intervention and respond well to treatment. According to data from poison control centers 2.3 million cases of poisoning were recorded in the United States in 2011. Among those cases 26.4% had to be treated in a health care institution, while 7.1% required hospitalization. The mortality rate among all cases was 5%.^[3]

In Turkey, the number of poisoning cases constitute 0.46-1.78% of all cases admitted to the emergency department.^[4-7] However, Yağın et al. reported this rate to be higher, at 2.43%.^[8] The percentage of poisoning cases among all emergency department cases varies from 1 to 3% in different countries.^[4,5] In our study, this percentage was found to be 0.77% and therefore was consistent with the literature.

The poisoning can be accidental or intentional (suicide). Accidental poisoning is more common in children and usually involves corrosive substances,^[4,9] while suicidal poisoning is more common in the adult group and is usually associated with medication intake.^[4,7,9-11] In our study, the most common cause of poisoning was also medication poisoning, followed by intoxication due to alcohol, and rodenticides, respectively. Zeren et al. also found similar results and reported that medication related poisoning and multiple medication intake were the most common causes of poisoning.^[10] When we compared the types of medications taken the most common was multiple medication intake, followed by antidepressants, non-steroidal analgesics and acetylsalicylic acid, respectively. Similar results are available in the literature.^[6,7,9] The easy access to analgesic drugs in some cases may lead to misuse of these drugs. In addition, the psychological status of patients using antidepressants may not be stable, making it easier for them to attempt suicide by means of these drugs.

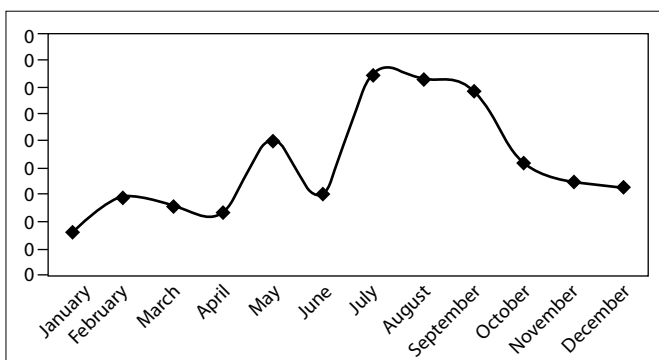


Figure 2. Distribution according to months.

According to the protocol of our hospital, patients over the age of 14 who are admitted to the hospital with poisoning are treated in the adult emergency department. Among 430 patients evaluated in our study 63 patients (14.65%) were between the ages of 14 (included) and 18 years. When these patients were evaluated in terms of causes of poisoning, 52 had been poisoned due to multiple medication intake, 5 due to intake of a caustic substance, 3 due to alcohol and 3 due to rodenticide intake. The assessment of patients over the age of 18 showed that the poisoning causes did not change and the most common cause of poisoning was multiple medication intake followed by caustic substance, alcohol and rodenticide intake.

The female/male ratio of poisoning cases has been reported to range from 1.12 - 3 and therefore, poisoning was reported to be more common in females.^[5,7,9-13] In our study we determined the female/male ratio to be 1.82/1 and women had a significantly higher poisoning rate ($p < 0.05$).

The mean age of female patients was 25.15 ± 9.56 years, while that of males was 31.39 ± 4.14 years. These results were consistent with previous studies conducted in our country.^[5,8,10-12] According to these results, young age and female gender can be considered as risk factors for accidental and or intentional poisoning.

In the literature, the rate of hospitalization ranges from 5.1% to 84%.^[4,5,7,10,11,13] We think that this percentage shows variation due to multiple factors such as the hospital in which the study was carried out being a reference hospital in that area, hospitalization of patients with bad symptoms or the patient being transferred from a different institution. In our study the hospitalization rate was 52.6% and we suggest that it might be because of our hospital being a level-three hospital and the presence of intensive care unit as well as dialysis facilities in our institution.

Karcioğlu et al. reported that 50% of their cases were admitted to the emergency room within first 2 hours of the poisoning,^[5] while Akin et al. reported this rate as 57.6%.^[11] Similarly, in our study 55.1% of patients were admitted to the hospital within the first 3 hours after the poisoning incident. In 9 patients that required intubation during their treatment process the time elapsed between the poisoning and hospital admission was found to be over 6 hours. The initial step in the general approach in cases with intoxication is stabilization of unstable patients (as it is for all unstable patients). Then, the support therapy specific for the poisoning case is initiated. The decontamination process can be used to reduce the local and systemic effects of the poisonous material.^[14] Delayed application to the hospital after poisoning causes delayed decontamination and treatment and therefore we think that this delay might be the one of

the reasons for requirement of intubation to ensure patient stabilization.

In earlier studies the mortality rate was reported to range from 0-2.5%.^[6,8-10,12] During the period of our study there were no deaths due to poisoning. After the poisoning took place the patients were rushed to the hospital and were treated at an early stage. Therefore, we suggest that early diagnosis and treatment may have prevented mortality. However, since the majority of mortality cases are usually recorded as having suffered from cardiopulmonary arrest and because our study was retrospective we were not able to obtain the patients' long-term survival information and therefore might not have detected cases of mortality.

Poisoning cases were admitted at various times. Zeren et al. reported that December was the month with the most frequent admissions due to poisoning,^[10] whereas Sonmez et al reported that admittance due to poisoning was most frequently observed in winter and least frequently observed in fall.^[12] On the other hand, Köse et al. indicated that March, April and October were the months with the highest number of suicide attempts.^[15] In our study, the most frequent admission to the hospital due to poisoning was seen in summer and in the month of July. Carbon monoxide poisoning is more common during the winter months because of intense usage of stoves for heating.^[16] Deniz et al. reported that fungi poisoning was more frequent in October and during the winter months,^[7] which was similar to the report by Ecevit et al., who also determined winter months to be the most frequent time for fungi poisoning.^[17] Our study does not contain carbon monoxide and fungi poisoning, which might be the reason for why in our study the poisoning rates were lower in winter months.

Limitations of the study: Since our study was conducted retrospectively we collected data from forensic notes and protocols and patient files and patients whose data was missing was excluded from the study. Moreover, carbon monoxide and fungi poisoning data were also missing and therefore such cases were not included in the study. In addition, the patients who were admitted to the emergency room with cardiopulmonary arrest, but whose medication intake was uncertain were also excluded from the study.

Conclusion

The results of our study were similar to previous studies conducted in Turkey. The poisoning cases were more common in women and medication intake was the most common cause of poisoning. By making it more difficult to acquire non-prescription medications and carrying out social investigations to raise awareness of intoxication, especially for the indicated risk groups can contribute to a reduction in poi-

soning cases. The first place where these cases are admitted is the emergency room and the patients' early diagnosis and treatment can lead to recovery without any consequences. We believed that emergency department physicians that are performing a differential diagnosis on patients should keep the possibility of poisoning in their mind. Unlike previously reported studies, in our study we found that summer is the most common time for poisonings. Poisoning cases vary by region and we believe that conducting multicenter studies in order to develop national policies would be useful to combat poisoning.

Conflict of Interest

The authors declare that there is no potential conflicts of interest.

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