

Original Article / Orijinal Araştırma

Analysis of individual and clinical factors in acute poisoning cases in the intensive care unit

Yoğun bakım ünitesindeki akut zehirlenme olgularının bireysel ve klinik faktörler yönünden analizi

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Abstract

Aim. In this retrospective study, the aim was to evaluate the clinical characteristics of all the acute poisoning cases monitored in our intensive care unit. **Methods.** Two hundred and twenty patients with acute poisoning treated in the intensive care unit of our hospital in a three-year period were included in this study. Age, gender, poisoning agent, whether the poisoning was deliberate, admission Glasgow Coma Score (GCS), duration of hospitalization, mechanical ventilation requirement, and clinical outcomes were recorded. Patients with incomplete medical records were excluded from the study. Statistical analysis was carried out by grouping the patients according to their gender, cause of poisoning, and poisoning agent. **Results.** In most of the acute poisonings, cases were females; and furthermore, in these cases, suicide attempt was the most common cause and causative agent was frequently drugs. Ratio of poisoning with suicidal intent was higher in females. Mortality rate was higher in males. Mortality rate was higher in poisonings with suicidal intent. In cases who died, duration of hospitalization was longer and GCSs were lower. **Conclusions.** Various individual and clinical factors such as age, gender, cause of poisoning, poisoning agent, GCS, duration of hospitalization, and mechanical ventilation requirement may contribute to the clinical outcome of acute poisoning cases. Careful assessment of findings of clinical history and examination and laboratory workup and observation of clinical course during follow-up in intensive care unit is a necessity to improve clinical outcome of patients with acute poisoning.

Keywords: Poisoning, intensive care, coma score, suicide

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Duger et al.: Analysis of acute poisoning cases

101

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Özet

Amaç. Bu retrospektif çalışmada, yoğun bakım ünitemizde izlenen tüm akut zehirlenme olgularının klinik özellikleri irdelendi. **Yöntem.** Kliniğimizin yoğun bakım ünitesinde son 3 yılda tedavi edilen 220 akut zehirlenme olgusu geriye dönük olarak değerlendirildi. Hastaların yaş, cinsiyet, maruz olunan zehirlenme etkeni, zehirlenmenin intihar amaçlı olup olmadığı, girişteki Glasgow koma skoru (GKS), hastanede yatış süresi, mekanik ventilatör ihtiyacı ve tedavi sonucu bilgileri kaydedildi. Dosyalarında bilgileri eksik olan hastalar çalışma dışı bırakıldı. Hastalar cinsiyetlerine, zehirlenme nedenine, ve zehirlenme etkenlerine göre gruplara ayrılarak istatistiksel değerlendirme yapıldı. **Bulgular.** Akut zehirlenme olgularının çoğunlukla kadın, intihar nedeni ve ilaç etkenli olduğu saptandı. İntihar nedeni zehirlenme durumlarının kadınlarda daha fazla idi. Erkeklerde zehirlenmeye bağlı ölüm oranının daha yüksek olduğu, intihar nedeni zehirlenme olgularında ölüm oranlarının daha yüksek olduğu, ölümle sonuçlanan olgularda hastanede yatış sürelerinin uzun, giriş GKS'larının düşük olduğu gözlemlendi. **Sonuçlar.** Sonuç olarak akut zehirlenme olgularında yaş, cinsiyet, zehirlenme nedeni, zehirlenme etkeni, GKS, hastanede yatış süresi ve mekanik ventilatör ihtiyacı gibi farklı bireysel ve klinik faktörlerin zehirlenme kliniğinde etkin rol oynayabilir. Klinik öykü ve muayene ve laboratuvar testlerinden elde edilen bulguların değerlendirilmesi ve yoğun bakımda takip edilirken klinik seyirin gözlemlenmesi akut zehirlenme olgularının klinik sonuçlarının iyileştirilmesi için gereklidir.

Anahtar sözcükler: Zehirlenme, yoğun bakım, koma skoru, intihar

Introduction

Poisonings, which are important medical emergencies requiring fast intervention, are one most important reasons of hospitalization in intensive care units [1-3] Poisonings are caused by various agents. Majority of these agents are medical drugs and pesticides although climatic and regional agents such mushrooms and carbon monoxide are observed frequently too. While ingestion of these agents may occur because of an accident, suicidal attempts has been the main cause of exposure recently. In the literature, it has been reported that 95% of poisonings involve self-ingestion [4, 5].

Poisoning cases, particularly observed in developing countries, have been reported to be the ninth leading cause of death in young population throughout the world in 2000s [2]. Poisoning, which is a frequent medical emergency requiring treatment at intensive care units, is the most important cause of morbidity and death observed at intensive care units [6].

In the present study, our aim was to evaluate clinical characteristics of acute poisoning cases managed in our intensive care unit during the last 3 years.

Materials and Methods

After obtaining the approval from the Human Ethics Committee of our university, the present study was conducted retrospectively on 220 acute poisoning cases managed in the

intensive care unit of our Anesthesiology and Reanimation Clinic between 1 January 2009 and 31 December 2012.

Age, gender, poisoning agent, whether the poisoning was deliberate, Glasgow Coma Score (GCS) at admission, duration of hospitalization, mechanical ventilation requirement, and treatment outcomes were recorded by reviewing medical records. Those having incomplete medical records were excluded from the study.

Statistical evaluation was performed by grouping the patients based on their gender, cause of poisoning, and clinical outcome. Clinical data were analyzed with chi-square and t tests and ANOVA test with post hoc Turkey test as appropriate. Data were presented as mean±SD or ratio as appropriate. $P<0.05$ was regarded as statistically significant.

Results

Of the 220 patients included in the study, 93 were males while 126 were females. General average age was 33.5 ± 17.7 years old (Table 1). The age was 36.2 ± 17.8 in males and 31.6 ± 17.5 in females, and there was no statistically significant difference between males and females. When the cases were examined in terms poisoning agents, four main agents were observed. Poisoning was caused by drugs in 172; methyl alcohol in 17; carbon monoxide in 14; and mushroom in 17 cases. Of the cases, 168 were classified as suicidal while 52 were classified as accidental poisoning. The admission GCS was 12.5 ± 3.9 . The duration of hospitalization was found as 4.3 ± 4.0 days (Table 1).

Table 1. Selected demographic and clinical data of study population.

	Cases (n=220)
Age (y)	33.5 ± 17.7
Gender (M/F)	93/127
Cause of poisoning (Suicide/Accident)	168/52
Poisoning Agent (Drug/Methyl alcohol/Carbon monoxide/Mushroom)	172/17/14/17
Admission Glasgow coma score	12.5 ± 3.9
Mechanical ventilation requirement (Yes/No)	34/186
Duration of hospitalization (d)	4.3 ± 4.0
Outcome (Died/Survived)	17/203

When the groups were compared in terms of gender, the age, duration of hospitalization and admission GCS did not show any gender differences. The rates of mechanical ventilation requirement and mortality were significantly higher in males when compared to the females ($p<0.05$). In females, the rate of suicidal poisoning was significantly higher when compared to the males ($p<0.05$) (Table 2).

Table 2. Comparison of selected clinical data with regard to gender of the study population.

	Male (n=93)	Female (n=127)	Significance
Age (y)	36.2±17.8	31.6±17.5	0.061
Cause of poisoning (Suicide/Accident)	60/33	108/19	0.001
Admission Glasgow coma score	11.9±4.2	12.9±3.6	0.060
Duration of hospitalization (d)	3.9±2.5	4.6±4.8	0.260
Outcome (Surviving/Dying)	80/13	123/4	0.011

When suicidal and accidental poisonings were compared, there was no difference in terms of GCS and duration of hospitalization ($p > 0.05$) while the ages of patients hospitalized for suicidal poisoning were significantly lower ($p < 0.05$). In suicidal poisonings, 3.0% of the patients died while the said ratio was 23.1% in accidental poisonings ($p < 0.05$). The rate of mechanical ventilation requirement was higher in accidental poisonings (30.8%) when compared to suicidal poisonings (10.7%) ($p < 0.05$).

When the cases were grouped in terms of poisoning agents, duration of hospitalization did not show any difference among 4 groups. Ages of those poisoned by drugs were lower when compared to those poisoned by other agents ($p < 0.05$). In terms of age, there was no difference among the other 3 groups. When the cases were compared in terms of GCS, it was found that admission GCS scores were lower in methyl alcohol poisonings ($p < 0.05$). Mortality rates were 3.5%, 52.9% and 14.3% and 5.9% in drug, methyl alcohol, carbon monoxide and mushroom poisonings, respectively. The rate of mechanical ventilation requirement was 12.2% in drug poisonings, 52.9% in methyl alcohol poisonings, 28.6% in carbon monoxide poisonings and 0% in mushroom poisonings (Table 3).

Table 3. Comparison of selected clinical data with regard to poisoning agent of the study population.

	Drug (n=172)	Methyl alcohol (n=17)	CO (n=14)	Mushroom (n=17)	Significance
Age (y)	29.0±15.4	50.6±8.4	44.7±22.0	53.2±16.7	0.000
Gender (M/F)	63/109	17/0	6/8	7/10	0.000
Cause of poisoning (Suicide/Accident)	166/6	1/16	0/14	1/16	0.000
Glasgow coma score at admission	12.7±3.6	8.5±6.1	12.6±3.6	13.6±2.5	0.000
Hospital stay (d)	4.4±4.4	3.8±2.2	3.9±1.8	3.8±1.5	0.824
MVR (Yes/No)	21/151	9/8	4/10	0/17	0.000
Outcome (Survived/Died)	166/6	8/9	12/2	16/1	0.000
MVR, mechanical ventilation requirement.					

When survivors and those dying were compared, average age was higher, duration of hospitalization was longer and admission GCS scores was lower in those dying ($p < 0.05$) (Table 4).

Table 4. Comparison of selected clinical data with regard to clinical outcome of study population.

	Survived (n=203)	Died (n=17)	Significance
Age (y)	31.8±16.7	54.8±16.6	0.000
Gender (M/F)	80/123	13/4	0.003
Cause of poisoning (Suicide/Accident)	163/40	5/12	0.000
Admission Glasgow coma score	13.2±3.0	3.3±1.0	0.000
Hospital stay (d)	4.1±3.6	6.6±6.9	0.014
Mechanical ventilation requirement (Yes/No)	17/186	17/0	0.000

Discussion

In the present study, acute poisoning cases followed-up by our intensive care unit for 3 years were evaluated in terms of gender, age, cause of poisoning, poisoning agent, mechanical ventilation requirement, admission GCS and duration of hospitalization.

In most of the acute poisonings, cases were females, there was a suicide attempt and causative agent was drugs. Ratio of poisonings with suicidal intent were higher in females, mortality rate was higher in male poisoning cases, mortality rate were higher in poisonings with suicidal intent and duration of hospitalization was longer and Glasgow Coma scores were lower in cases resulted in death.

In our study, the average age of the cases was 33.55±17.75 years. In a study conducted in 2009, Şencan et al. [1] analyzed the medical records of 121 poisoning cases followed-up in the intensive care unit retrospectively and found that the average age of the cases was 38.15±14.38 years, which was similar to our results. Average age was found to be 33.4±16.0 years by Poplas-Susic et al. [4], 25.87 years in women and 28.06 years in men by Katı et al. [7] in 2004 and 23±8 years in acute poisoning cases followed-up at the internal diseases service by Akın et al. [9]. As it is seen, average ages obtained in acute poisoning cases are similar.

Moreover, in our study, when suicidal and accidental poisonings were compared, average age was found to be lower in suicidal poisonings. This shows that suicidal intention is higher in young patients, as observed in the literature too [10, 11]. Similarly, O-Donovan et al. [12] reported that those followed-up in the intensive care unit for drug poisoning were young patients.

In our study, female to male ratio was 1.3/1. According to the pertinent literature, the ratio of females are slightly higher than males in acute poisonings [1, 2, 7, 6]. Şencan et al. [1] reported a female to male ratio of 1.2/1, and that data was similar to the result that obtained in the present study. However, there were also other studies reported the number of males is slightly higher in poisoning cases [4, 11, 13]. Differences in the clinical characteristics of

patients with acute poisoning may be a result of the regional and cultural features. It may be affected by whether the poisoning is suicidal or accidental.

In our study, the ratio of suicide was significantly higher in females when compared to the males. This is consistent with the literature where it is reported that suicidal intent is higher in females. Staikowsky et al. [14] reported that 2/3 of 722 drug poisoning cases with suicide intent were females. Similarly, Viertel et al. [15] found that the ratio of suicidal poisoning was higher in females.

When the cases in our study were examined for poisoning agents, drugs were the causative agent in majority of the cases. Similar to our study, many studies have shown that the causative agent was drugs in cases presenting to hospital with acute poisoning [8, 11, 16]. While these drugs can be ingested individually, multiple-drug poisonings are observed too. Drug agents used in poisoning cases can be grouped as antidepressants, antidiabetics, antihypertensives, analgesics, pesticides, and poisons. Majority of drug poisonings are related to the suicidal intentions [11].

The agents stated in the literature, other than drugs, are methyl alcohol, carbon monoxide and mushroom as stated in our study too. The frequency of poisoning agents may vary in different regions. In our study, the reason of having drug poisonings more might be related with having suicidal poisoning cases more. Studies have reported that the ratio of suicidal poisonings in cases presenting to hospitals with poisoning varies between 47% and 97% [11, 17, 18].

In our study, mortality rate was found as 15.7%. Mortality rates found in other studies are similar to the rate found in our study [1, 3]. In our study, average age was higher, duration of hospitalization was longer and admission GCS was lower in those dying. In their studies, Seydaoğlu et al. [19] and Şencan et al. [1] found that, along with age, gender, clinical status, and type of toxic agent were effective on mortality in poisoning cases too.

In conclusion, various individual and clinical factors such as age, gender, cause of poisoning, poisoning agent, GCS, duration of hospitalization, and mechanical ventilation requirement may contribute to the clinical outcome of acute poisoning cases. Careful assessment of findings of clinical history and examination and laboratory workup and observation of clinical course during follow-up in intensive care unit is a necessity to improve clinical outcome of patients with acute poisoning.

Conflict of Interest

The authors declare that there is no conflict of interest.

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Duger et al.: Analysis of acute poisoning cases

106

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