

Retrospective Evaluation of Emergency Service Patients With Poisoning: A 3-Year Study

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ABSTRACT

The purpose of this retrospective study was to evaluate the characteristics of cases of acute poisoning in adults who were admitted to emergency service over a 3-year period. Clinical charts were analyzed retrospectively for etiologic and demographic patient characteristics. A total of 810 adults were admitted to the emergency center with acute poisoning. The female-to-male ratio was 2:1. Mean ages of female and male patients were 28.8 ± 12.9 years and 35.1 ± 15.4 years, respectively, and many patients (46.9%) were between the ages of 16 and 25 years. Medicinal drugs were found to be the primary cause (60.5%) of poisoning, and tricyclic antidepressants were the most frequent causative agents (36.3%). Seasonal distribution of poisoning cases suggested a peak in the summer months (35.4%). Overall, 68.6% of acute poisonings were suicide attempts, and of these patients, 84.9%, 14%, and 1.1% were attempting suicide for the first, second, and third times, respectively. Among 810 cases of acute poisoning, 15 were fatal. The following conclusions were reached by investigators: (1) in the test region, younger females, especially single females, were at greater risk for poisoning than other patient groups, (2) self-poisoning cases constituted the majority of all poisonings, and (3) the main agents of self-poisoning were medicinal drugs, with antidepressants used most frequently. It was also found that unintentional poisoning commonly resulted from intake of foods, especially mushrooms.

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INTRODUCTION

Poisoning refers to the development of harmful effects following exposure to specific chemicals; it may occur intentionally or unintentionally. Prevalence and causes of poisoning differ from country to country, but in general, 0.02% to 0.9% of patients admitted to the emergency department (ED) are treated for poisoning.¹⁻³

In the Middle Black Sea region, patients with poisoning who are admitted to various hospitals are usually referred to Ondokuz Mayıs University Medical Faculty Hospital because it has an intensive care unit. The number of patients admitted to the ED of this hospital ranges from 16,500 to 17,000 per year; those treated include approximately 250 to 270 patients with acute poisoning.

In this study, data related to adult patients admitted to this hospital for poisoning were retrospectively analyzed for the purposes of (1) defining etiologic and demographic characteristics, and (2) comparing these characteristics with those reported from other parts of the country and from other countries of the world.

METHODS

In this retrospective study that was performed between January 1, 2002, and January 1, 2005, data from 810 adult patients admitted to the Ondokuz Mayıs University Hospital ED because of poisoning were recorded and analyzed.

A form was prepared on which the following information was recorded: demographic data (age, sex, marital status, job), time of arrival to the ED, mental status, cause of poisoning, route of intake (skin contact, inhalation, ingestion), purpose of intake of poisonous agent (suicide, accidental), length of hospital stay, seasonal distribution, need for consultation with a psychiatrist, number of previous suicide attempts, previous treatments received, admission rate to another care unit, and, finally, previous outcomes (eg, complete recovery, need for ongoing treatment). Documentation also stated whether patients were admitted directly to the ED or were referred from other regional hospitals.

Patients were enrolled in the study if any of the following occurred: (1) ingestion of caustic and irritating agents, (2) poisoning with pesticides, (3) carbon monoxide poisoning, (4) alcohol intoxication, (5) food poisoning, including mad honey poisoning and mushroom poisoning, and (6) ingestion of natural poisons, including plant or animal products.

The following patients were excluded from the study: (1) those whose clinical and toxicologic data were insufficient to permit the diagnosis of poisoning, (2) pediatric patients, (3) patients who had experienced adverse reactions and secondary effects related to drug treatment, and (4) those who had ingested an inert foreign body.

Toxic agents were classified as medicinal drugs, pesticides, gases, corrosives, alcohol, and foods. Drugs were classified as antidepressants, analgesics, benzodiazepines, antimicrobial agents, cardiovascular drugs (eg, antihypertensive drugs, beta blockers, diuretics), drug combinations, and others (ie, vitamins, H₂ blockers, anticonvulsants, antidiabetic agents). Foods were classified as mushrooms, mad honey, and other foods.

Patients were subdivided into 4 age groups: ages 16 to 25, 26 to 35, 36 to 45, and older than 45 years. To assess the level of consciousness of patients, the Glasgow Coma Scale (GCS) was used.⁴ Data were presented as frequency and mean±standard deviation; these values were evaluated by means of the χ^2 test.

RESULTS

A total of 810 poisoning cases were identified among the 48,468 patients admitted to the ED during the previous 3 years. They accounted for 1.67% of all emergency admissions. A predominance of female patients ($n=534$, 65.9%) over males ($n=276$, 34.1%) was noted; the female-to-male ratio was 2:1 ($\chi^2=82.2$, degrees of freedom [df]=1, $P<.001$). Mean ages of female and male patients were 28.8 ± 12.9 years and 35.1 ± 15.4 years, respectively.

The stratified age distribution was as follows: 380 patients (46.9%) were between 16 and 25 years of age, 184 (22.7%) were between 26 and 35 years, 110 (13.6%) were between 36 and 45 years, and 136 (16.8%) were older than 45 years of age (Fig 1).

In all, 442 patients (54.6%) were married, and 344 (42.5%) were single. Only 24 patients (3%) were widowed. Housewives accounted for the majority of poisoning cases, with a frequency of 36.9%. Other patients treated for poisoning consisted of the following: 172 students (21.2%), 151 workers (18.6%), 74 unemployed persons (9.1%), 65 farmers (8%), 26 retirees (3.2%), 19 merchants (2.3%), and 4 (0.5%) soldiers.

Arrival times of patients to the ED after poisoning were as follows: 168 patients (20.7%) within 2 hours, 404 patients (49.9%) between 3 and 5 hours, 194 patients (24%) between 6 and 12 hours, 33 patients (4.1%) between 13 and 24 hours, and 11 patients (1.4%) later than 24 hours after the time of poisoning.

The mental status of patients on admission was generally good. It was determined that 656 patients (81%) were fully awake (GCS score, 15), 79 (9.8%) were drowsy (GCS score, 12–14), and 75 (9.3%) were in a stupor or coma (GCS score, 3–11). Most of those in the last group ($n=38$) had been poisoned with drugs.

Causative factors for acute poisoning included the following: medicinal drugs ($n=490$, 60.5%), pesticides ($n=98$, 12.1%), gases that had been inhaled ($n=41$, 5.1%), corrosives ($n=26$, 3.2%), foods, including mushrooms, mad honey, and other foods ($n=140$, 17.3%), and alcohol ($n=15$, 1.9%). In this study, medicinal drugs were major causative factors for acute poisoning (Table 1). Routes of intake were as follows: 91.2% orally, 7.7% by inhalation, and 1.1% through skin contact.

Among all cases, 556 (68.6%) were suicide attempts; of these, 472 (84.9%), 78 (14%), and 6 patients (1.1%) were attempting suicide for the first, second, and third times, respectively. The mean age of suicide attempters was 27.1 ± 10.8 years. A predominance of female patients ($n=398$, 71.6%) over males ($n=158$, 28.4%) was noted ($\chi^2=103.6$, $df=1$, $P<.001$).

The seasonal distribution of poisoning cases suggested a peak in the summer (35.4%) and in the spring (24.9%) and a decrease in the autumn (21.7%) and in the winter (17.9%) (Fig 2). Psychiatric consultation was provided for 92.6% (515/556) of patients. Depression was the most frequently associated psychiatric disorder; 22.7% of patients were reported to have no psychiatric disorders. Other psychiatric disorders included the following: 15%, adaptation disorder; 14.4%, anxiety disorder; 8.2%, personality disorder; 6.2%, conversion; and 1.9%, schizophrenia.

Fig 1. Age distribution of poisoning cases.

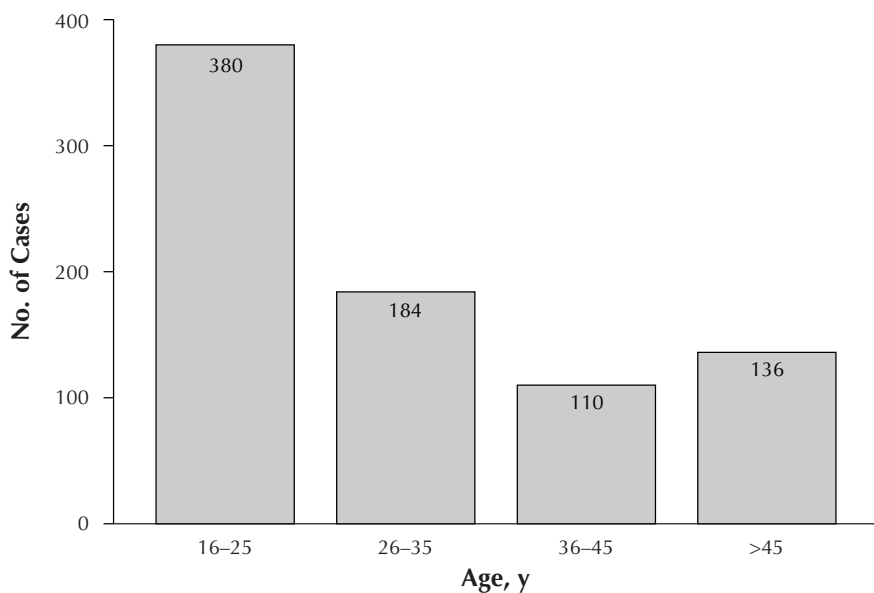
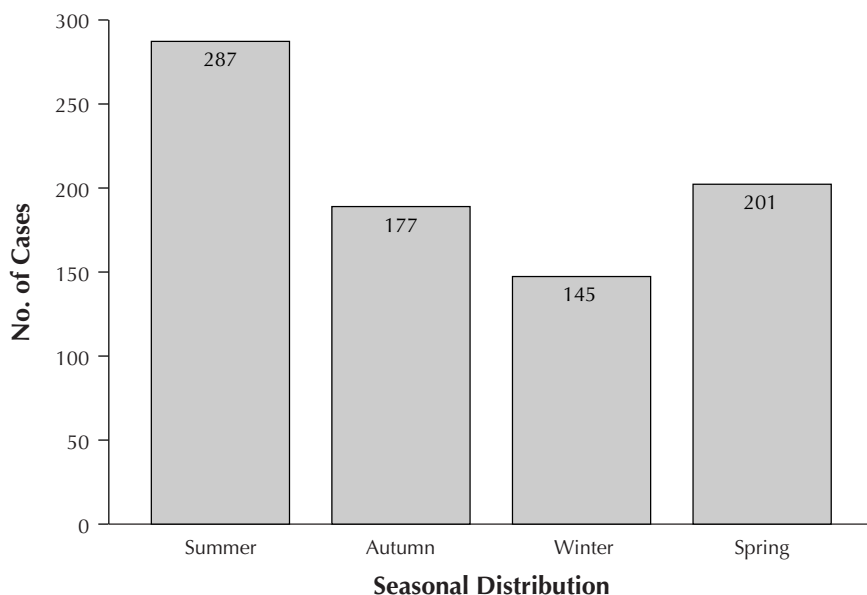


Table 1. Causative Factors Responsible for Intoxication

Causative Factor	No. (%)
Medicinal drugs	490 (60.5)
Food	140 (17.2)
Mushrooms	108 (13)
Mad honey	10 (2)
Other foods	22 (2.2)
Pesticides	98 (12.1)
Carbon monoxide	41 (5.1)
Corrosives	26 (3.2)
Alcohol	15 (1.9)
Total	810 (100)

Fig 2. Seasonal distribution of poisoning cases.



Admissions included 729 patients admitted to the ED, as well as 17 admitted to the psychiatry ward, 18 admitted to the intensive care unit, and 17 admitted to other wards (eg, internal medicine ward, thoracic surgery ward). After initial management was provided, 29 patients left the hospital against medical advice or without notice.

Initial treatment was given to all patients in the ED. Gastrointestinal decontamination was performed with the use of stomach washout and activated charcoal in 88.3% (715/810) of cases. In all, 10.6% of patients received specific antidote treatment (eg, acetylcysteine, sodium bicarbonate, pralidoxime), 2.6% underwent hemodialysis, and 11.7% were given symptomatic treatment. Treatment follow-up lasted between 1 and 24 hours in 199 cases (24.6%), between 25 and 48 hours in 498 cases (61.5%), between 49 and 72 hours in 72 cases (8.9%), and for longer than 72 hours in 41 cases (5.1%).

A total of 15 of 810 cases (1.9%) of acute poisoning were fatal. Causes of acute poisoning were identified as contact with pesticides, carbon monoxide inhalation, intake of mushrooms, and corrosive ingestion in 6, 5, 3, and 1 case, respectively.

DISCUSSION

Poisoning often occurs in patients with very severe problems. They must be evaluated attentively and treated appropriately, even though this requires an investment of hospital personnel time; a clear determination of prognosis can be made only after an adequate detailed history has been obtained.

In the present study, poisoning cases accounted for 1.67% of all admissions to the ED. In another noteworthy Turkish epidemiologic study that was conducted in Istanbul, authors reported a 2.4% occurrence of poisonings among the total number of emergency admissions.⁵ However, Ozköse et al¹ and Goksu et al⁶ found that 0.7% of emergency admissions were cases of poisoning received from other hospitals in the country. Emergency admissions in this study were in accordance with those noted in other national reports.

In this study, poisoning peaked between the ages of 16 and 25 years in both sexes. Young females between the ages of 16 and 25 years accounted for the majority of suicidal poisonings. This finding is consistent with those of other national reports^{1,5-7} and with international data.^{8,9}

The primary etiologic factor for intoxication was identified as medicinal drugs (60.5%), a finding that is similar to those of other studies conducted in Turkey.^{1,5,6} In previous studies from Turkey, analgesics were the most commonly ingested agents. In this study, tricyclic antidepressants were the most frequently used drugs (36.3%) (Table 2), especially among young suicide attempters in the region. Such a high incidence of tricyclic antidepressant poisoning may be due to extensive prescribing of these drugs. Furthermore, most tricyclic antidepressants are sold without a prescription. For this reason, the sale of antidepressants with low reliability should be limited.

Table 2. Drug Categories Responsible for Intoxication

Drug Category	No. Patients (%)
Antidepressants	178 (36.3)
Analgesics	122 (24.9)
Benzodiazepines	29 (5.9)
Antibiotics	23 (4.7)
Cardiovascular drugs	23 (4.7)
Drug combinations	78 (15.9)
Others	37 (7.6)
Vitamins	10 (2)
Antidiabetic agents	5 (1)
H ₂ blockers	9 (1.8)
Bronchodilators	3 (0.8)
Anticonvulsants	10 (2)
Total	490 (100)

It has been reported that most first suicide attempts have been followed by repeat attempts within 1 year, resulting in death in 1% to 2% of cases.¹⁰ In the authors' opinion, follow-up provided by a psychiatrist for patients who have attempted suicide is very important. In this study, 515 patients who attempted suicide (92.6%) consulted with a psychiatrist; 41 patients (7.4%) could not participate in such consultation because their physically poor condition precluded a psychiatric examination. The psychiatric disorder most commonly diagnosed among suicide attempters was depression (31.3%). These results were consistent with those of other studies.¹⁰⁻¹²

It has been reported that suicide attempts were more common among those younger than 30 years of age, females, those who are single, unemployed persons, and those diagnosed with depressive disorder.^{10,11} In this study, most of those who attempted suicide were single students. The authors have speculated that the increased frequency of suicide attempts among young women may be related to their inability to express themselves because of the repressive practices of their fathers.

Hanssens et al³ have reported that 79% of poisoning episodes are caused by oral ingestion, 12% by animal bites, 4% by skin contact, 2% by inhalation, 2% by the intravenous route, and 1% by eye contact. In the present study, 91.2% of poisonings resulted from oral ingestion; no animal poisoning was reported. In the test region, poisonous animals are seldom seen, and if an animal poisoning occurs, treatment is generally provided at primary or secondary health care centers—not at the University Hospital. Of all poisonings, 7.7% occurred through inhalation of carbon monoxide and pesticides, a fact that can be attributed to common usage of stoves for heating homes and proximity to pesticides for agricultural purposes.

In this study, the number of poisoning cases was higher in the summer. This may be associated with the positive correlation between the number of suicide attempts and ambient temperature and duration and intensity of sunlight.¹³

Burillo-Putze et al⁴ found that 34.2% of patients arrived to the ED within the second hour after poisoning. Akkas et al¹² also reported that 52% of patients arrived to the ED within the second hour. In this study, 20.7% of patients arrived to the ED within 2 hours after poisoning and 49.9% within 2 to 6 hours. The low percentage arriving to the study hospital within the first 2 hours may be due to the fact that patients from villages and small towns first visited primary or secondary health care centers, from which they were referred to the university hospital.

In their study, Tufekci et al⁵ reported that 15%, 47%, and 38% of patients stayed at the hospital for 1 to 12 hours, 13 to 24 hours, and longer than 24 hours, respectively. Investigators in the current study found that 75.4% of patients stayed longer than 24 hours. It is believed that this occurred because a high number of patients presented with decreased levels of consciousness, probably caused by their delayed arrival times.

The second most common poisoning was food poisoning, the frequency of which was higher than was documented in previous studies.^{1,3,5} Food poisoning commonly resulted from the digestion of mushrooms picked from nature. Patients from low socioeconomic levels would pick and eat poisonous mushrooms because they did not understand the potential danger of this practice.

Akkas et al¹² found that the mortality rate associated with poisoning was less than 1%. Kekec et al⁷ reported this mortality rate as 2%. The mortality rate noted in the present study was in accordance with previous reports from Turkey. Only 15 deaths were observed in this study. Two of these involved carbon monoxide poisoning (these patients were the only 2 who had been admitted to the ED within 2 hours after the incident). Another 2 and 4 of those who died were diagnosed with carbon monoxide and pesticide poisonings, respectively; they had been admitted to the ED within 3 to 5 hours. The remaining 7 of those who died were diagnosed with carbon monoxide (1 case), pesticide (2 cases), mushroom (3 cases), and corrosive (1 case) poisonings and had been admitted longer than 5 hours after the event. The number of deaths was higher in the group that had been admitted to the ED longer than 5 hours after the event. This finding suggests that early admission to the ED and early treatment may prove lifesaving in patients with poisoning.

Investigators of this study concluded that in this region of Turkey, younger females, especially those who are single, are at greater risk than other patient groups for poisoning; also, self-poisoning cases account for the majority of poisonings, and the primary cause is medicinal drugs—most commonly, antidepressants. Unintentional poisoning is commonly caused by foods, especially mushrooms.

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