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## Evaluation of the Patients with Acute Intoxication

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**Abstract:** Objective: We evaluated the patients who were hospitalized for acute intoxications. We report the etiologies of intoxications, mortality rate, and the outcomes of treatment modalities.

**Materials and Methods:** Data is given of patients who were hospitalized in the Intensive Care Unit of Erciyes University Medical Faculty from January 1, 1993 to December 31, 1999. The total number of patients followed in the Medical Intensive Care Unit during this period were 3500 and 272 (7.8%) of them were acute intoxications. One hundred and six patients were male (mean age; 31±18 years) and 166 were female (mean age; 24±15 years).

**Results:** Insecticides were the most common causes of intoxications with 95 patients. Other common causes were sedative-antidepressants (57 cases), mushrooms (26 cases) and carbon monoxide (24 cases). The biggest parts of the insecticides were

organophosphates with 59 patients. Suicidal attempt was present in 197 patients. All alcohol intoxications were with consumption of ethyl alcohol. The rest of the patients (69 cases) were accidental exposures. The causes of deaths were insecticides in 13 patients, alcohol in 3 patients, carbon monoxide in 2 patients, mushrooms in 2 patients, and naphthalene in a patient. Specific antidote has been used for 73 patients. 11 (15%) of the patients, who died, received specific antidote treatment.

**Conclusion:** Intoxications are one of the most common causes for admissions to the Intensive Care Units. The causes of intoxications change with the characteristics of region, hospital and departments. Appropriate supportive care alone may save the lives of patients. However, if there is a specific antidote, it must be given.

**Key Words:** Intoxication, suicide, Intensive Care Unit

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### Introduction

Poisonings remain as a serious public health problem despite regulatory intervention and medical advances (1). Common sources of poisons include drugs, chemical compounds, plants, industrial wastes, and food substances. Newly developed chemical compounds and exposure to these agents or using these agents for suicide attempts are increasing the numbers of intoxications (2-5). The numbers of intoxications around the world are not known. In 1993, over 1.7 million exposures to potential poisons were reported by poison centers participating in the American Association of Poison Control Centers Toxic Exposure Surveillance System (AAPCC-TESS) (3). Intoxication rate is estimated as 0.04 % per year in Turkey (5). It is difficult to treat these patients since there are many compounds that may cause acute intoxication and the causative agent could not be specified in most of the cases. Additionally, there are not any specific treatments for most of intoxication. Thus,

supportive and non-specific treatment is the most important part of the treatment (1, 2, 6).

In this study, we evaluated the patients who were hospitalized because of acute intoxications, in the Medical Intensive Care Unit of Erciyes University Medical Faculty. We report the reasons of intoxications, mortality rate, and the results of treatment modalities.

### Materials and Methods

This retrospective study was performed in the Medical Intensive Care Unit of Erciyes University Medical Faculty.

Data is given of patients who were hospitalized in the Medical Intensive Care Unit from January 1, 1993 to December 31, 1999. The total number of patients followed in the Medical Intensive Care Unit during this period were 3500 and 272 (7.8%) of them were acute intoxications. 106 (39%) patients were male (mean age; 31±18 years) and 166 were female (mean age; 24±15

years). Causative agents of intoxication, the way of intoxication (accidental or suicide), the route of intoxication (gastrointestinal system, inhalation, skin, intravenously), underlying diseases, mortality and morbidity, specific and supportive treatment measures has been recorded.

Toxic agents were classified as; sedative-antidepressants, insecticides, carbon monoxide, mushrooms, corrosives, alcohol, plants, oral antidiabetics, naphthalene, analgesics, or miscellaneous drugs.

Diagnoses of intoxications were based on the history taken either from the patients or patients' relatives and clinical signs of the patients. Diagnoses were confirmed with plasma cholinesterase levels for organophosphate poisonings, with alcohol levels for alcohol intoxications and carboxyhemoglobine levels for carbon monoxide poisonings as long as the tests are available.

Statistical comparisons were performed with Chi square tests and student-t test. A p value of <0.05 considered significant.

**Results**

Causative agents of acute intoxications are shown in Table 1. Insecticides were the most common causes of intoxications with 95 patients (35%) among our patients. Other common causes were sedative-antidepressants (57 cases), mushrooms (26 cases) and carbon monoxide (24 cases). There were not any intoxications with industrial

wastes. The biggest part of the insecticides was organophosphates with 59 patients.

Suicidal attempt was present in 197 (72%) patients. All alcohol intoxications (6 cases, 2.2%) were with consumption of ethyl alcohol. The rest of the cases (69 cases, 25%) were accidental exposures. 11 of these 69 cases were poisoned with insecticides, 26 cases with mushrooms, 24 cases with carbon monoxide, 5 cases with corrosives, 2 cases with plants, and 1 case with naphthalene.

Only 9.6% of the intoxications were by inhalation, the rest of the cases were with the route of gastrointestinal system.

Twenty-one patients (7.7%) died. The causes of death were insecticides in 13 patients, alcohol in 3 patients, carbon monoxide in 2 patients, mushrooms in 2 patients, and naphthalene in a patient. This mortality rate was responsible for 3.8% of total mortality rate of the Medical Intensive Care Unit for the same time interval. Specific antidote has been used for 73 cases (49 with organophosphate and 24 with carbon monoxide). Eleven (15%) of the patients who died, received specific antidote treatment. Supportive measures has been applied are shown at Table 2. Sixteen patients needed mechanical ventilation and hemodialysis were performed for 6 patients. Thirteen of 16 patients who needed mechanical ventilation and 5 of 6 patients who had hemodialysis died.

Seventy four (27%) of the patients had one of the following underlying diseases; 37 depression, 11

Agent	Survived	Non-survived	Total	
			n	%
Sedative-antidepressants	57		57	21.0
Insecticides	82	13	95	35.0
-Organophosphates	51	8	59	21.7
-Unknown insecticides	27	2	29	10.7
-DDT	4	3	7	2.6
Carbon Monoxide	22	2	24	8.8
Mushrooms	24	2	26	9.6
Corrosive agents	5		5	1.8
Alcohol	3	3	6	2.2
Plants	2		2	0.7
Oral antidiabetics	5		5	1.8
Naphthalene		1	1	0.4
Analgesics	9		9	3.3
Miscellaneous	42		42	15.4
<b>Total</b>	<b>251</b>	<b>21</b>	<b>272</b>	<b>100.0</b>

Table 1. Causative agents in patients with intoxication.

Table 2. Supportive treatments.

1-	Keeping the airway open
2-	Cardiovascular support
3-	Prevention and treatment of hypoglycemia
4-	Oxygen treatment
5-	Gastric lavage
6-	Activated charcoal
7-	Cathartic
8-	Atropine
9-	Diazepam
10-	Treatment of brain edema
11-	Vitamin K, fresh frozen plasma
12-	Forced diuresis
13-	Prevention of kidney failure and hemodialysis
14-	Treatment of infections
15-	Enteral and parenteral feeding

schizophrenia, 9 epilepsy, 8 diabetes mellitus, 7 alcohol abuse, and 2 Familial Mediterranean Fever. Seven (33.3%) patients who died had underlying diseases. Three of them had alcoholism and four patients had depression. This rate was 36.4% for patients who survived ( $p>0.05$ ).

Mean duration of hospitalization was  $6.2\pm 5.7$  for survivors and  $5.9\pm 5.1$  for non-survivors ( $p>0.05$ ).

## Discussion

Since human intoxication rates are increasing around the world, intoxications has been very important health and socio-economical problem (1, 2). AAPCC reported that the number of intoxications in U.S.A. were 2.2 million (0.9 % of total population) in 1998. This report showed an increase by 2.2 % compared with 1997 poisoning reports (4). Intoxication rates change from one country to another. Unfortunately, records about intoxications are not proper enough in Turkey as in many developing countries. The Turkish Ministry of Health reported that 27144 poisonings admitted to the hospitals in 1996 (7). However, these data is not enough to detect treatment strategies and demographic characteristics of the patients.

Özköse and Ayoğlu (5) reported that 0.7% of the total admissions to their Emergency Department were intoxications. In another report from Turkey, Pinar et al.

(8) found this rate as 1.2 percent. However, Karakaya and Vural (9) showed that 5% of the emergency admissions were cases of intoxications, in another hospital in Turkey. We found that 7.8% of the Medical Intensive Care Unit admissions were intoxications.

The causes of intoxications change with the characteristics of region, hospital and departments. In the report of AAPCC, the most common causes of intoxications were cleansing agents, analgesics, cosmetic products and plants (4). Pinar et al. (8) reported that the most common causes of intoxications were analgesics, alcohol, pesticides, psychoactive drugs, carbon monoxide and mushrooms. In another study, Özköse and Ayoğlu (5) found that analgesics and psychoactive drugs were the most common causes of intoxications. In our study, insecticides, psychoactive drugs, carbon monoxide and mushrooms were the common causes of intoxications. Since we studied the patients who were admitted to an adult Medical Intensive Care Unit, etiological agents of intoxications were different from the previous studies. Intoxication with analgesics has been probably managed at the Emergency Department, and severely intoxicated patients have been sent to the Medical Intensive Care Unit.

Only 7.3% of intoxications were suicide attempts in the AAPCC report (4). But, in this report, therapeutic errors, animal bites/stings, food poisoning, malicious poisonings, environmental poisonings and childhood poisonings were also reported. Özköse and Ayoğlu (5) reported that 78.9% of their cases were suicide attempts. This rate was 39.8% of total intoxications in report of Pinar et al. (8). In present study, suicidal intoxications were 72% of intoxications. Suicidal intoxications might be more important than accidental intoxications. For example, in the report of AAPCC, 54.3% of all deaths were suicidal intoxications (4). Similarly, we found that 52.4% of deaths were suicidal intoxications.

Intoxications are one the most important cause of mortality. One percent of deaths were related to intoxications in U.S.A. (10). In 1995, the Turkish Ministry of Health reported that the mortality rate of poisonings was 1.2 percent. AAPCC reported that the mortality rate of intoxications was 0.035%, in 1998. However, specific antidote treatments were administered in 1.2% of intoxications (4). Mortality rate was reported as 0.004 in 1999 by AAPCC (11). Eddleston has been

reviewed 76 articles published between 1980 and 1999 and reported that mortality ratio ranges between 0 % and 50 % (12). The mortality rate was 0%, and specific antidote administration rate was 5.3% in report of Özköse and Ayoğlu (5). Pınar et al. found that the mortality rate was 0.8%, and antidote administration rate was 8.3% (8). We found that the mortality rate was 7.7% in our patients. Mortality rate related with intoxications was 3.8% of the Medical Intensive Care Unit mortality rate. Specific antidote treatments were administrated to 27% of cases and 15% of these patients died. These cases were 52.4% of all deaths related with intoxications. These different mortality rates were probably related to severity of intoxications (12). The most important factor indicating the severity of poisoning is the nature of the poison. The most frequent causes of poisonings were originating from plant, animals, and chronic intoxications in other studies. Although drug related poisonings were the most common cause of acute intoxication in these studies. Other factor indicating the severity of intoxication is admission to hospital and Intensive Care Units. However, our patients were acute

poisonings and mostly related to chemicals, and needed to intensive care management. On the other hand, AAPCC reported that the majority of cases admitted to poison centers were managed in a nonhealth care facility (78%) (11). Additionally, the distance of health center and losing the serious cases on the way to the hospital may have an effect on these results.

In conclusion, intoxications are one of the most common causes of hospitalization to the Intensive Care Unit. The causes of intoxications change with the characteristics of region, hospital and departments. Appropriate supportive care alone may save the lives of patients. But, if there is a specific antidote, it must be given.

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