

Hakan ALAGÖZLÜ<sup>1</sup>  
Hafize SEZER<sup>2</sup>  
Ferhan CANDAN<sup>3</sup>  
Ertan TABAK<sup>4</sup>  
Nazif ELALDI<sup>5</sup>

## A Survey of Patients with Acute Poisoning in the Sivas Region, Turkey, between 1994 and 1998

Received: November 30, 2000

**Abstract:** This study was carried out over the period 1994-1998 for the purpose of observing the poisoning incidence and of presenting a poisoning profile of the Sivas region, Turkey. During the study period, 1521 patients were admitted to hospitals with various poisonings in Sivas and these were retrospectively analyzed. The results were evaluated by a chi-square test. In 1521 (1054 females, 467 males) poisoning cases, the mean annual incidence of poisonings was found to be 0.048%. When poisoning cases were assessed etiologically, drug poisonings rated first (54.8%). The most commonly ingested drugs were antidepressants (39%), analgesic-antiinflammatories (31%), antihypertensives (7%) and miscellaneous drugs (23%). When the age groups were examined in terms of sex, the ratio of females

with acute poisonings decreased with age ( $p<0.01$ ). The period between 1997 and 1998 saw an increase in the number of females with acute poisonings ( $p<0.05$ ). In general, it is recommended that a profile be drawn for a specific region every five years. Such a profile helps both medical staff and the public develop easy and practical strategies for the specified range of poisonings. It is important to realize that the present study is region-based, hence it may be thought to be difficult to draw conclusions for the whole population of Turkey. However, it is thought that this will form a basis for analyzing poisoning cases for the Turkish population, based on the data gathered in this study.

**Key Words:** poisoning, adolescent, prevention, Turkey

Departments of <sup>1</sup>Emergency Medicine-Division of Internal Medicine, <sup>2</sup>Medical Biostatistics, <sup>3</sup>Internal Medicine, <sup>4</sup>Medical Student, <sup>5</sup>Infectious Diseases, Faculty of Medicine, Cumhuriyet University, Sivas - TURKEY

### Introduction

Poisonings, both suicidal and accidental, have become the most significant problem for emergency centers in Turkey (1-4). They may occur due to various reasons that threaten human life. In addition to herbal, food, pesticide-based, alcohol and gas poisonings, an accidental overdose of a drug or an intentional intake of medications may lead to poisonings. We believe that well-rounded data on the etiological features of the poisonings may help us develop a better treatment policy for poisoned patients in emergency centers and lead to more effective preventative measures being developed both by medical staff and by the public.

Therefore we retrospectively investigated the etiology of poisoned patients so as to obtain a profile of poisoning cases occurring in 1994-1998 in the Sivas region.

### Materials and Methods

In this study, data were obtained from 1521 (1054 female, 467 male) poisoned patients admitted to the

Emergency Departments of Cumhuriyet University Hospital, Numune State Hospital, Social Insurance Institute Hospital and the Children's Hospital in Sivas between January 1, 1994, and December 31, 1998.

Primarily, the types of poisonings commonly encountered in the area were determined. Then the age group at risk was indicated. In the statistical analysis, a chi-square test was used to compare the percentages of poisonings in the age groups, which were classified as 15 years and below, 15-24 years, 25-34 years, 35-44 years and 45 years and above.

### Results

When the subjects, 1054 of whom were females and 467 male, were evaluated in terms of sex, the frequency of women in 1997-1998 was high ( $p<0.05$ ) (Table 1). The incidence of poisonings for each year between 1994 and 1998 was 0.024, 0.040, 0.066, and 0.085 respectively. The mean annual incidence of poisonings between 1994 and 1998 was 0.048% (Table 2). When

Table 1. Distribution of poisoning cases according to year.

Years	Female n(%)	Male n(%)	Total (n)
1994	96 (60.7)	62 (39.3)	158
1995	166 (65)	89 (35)	255
1996	106 (63)	62 (37)	168
1997	301 (73)	112 (27)	413
1998	385 (73)	142 (27)	527
Total	1054 (69.3)	467 (30.7)	1521

poisoning cases were assessed etiologically, drug poisonings rated first (54.8%). The most commonly ingested drugs were antidepressants (39%), analgesic-antiinflammatories (31%), antihypertensives (7%) and miscellaneous drugs (23%). This was followed by herbal (mushrooms and unidentified detrimental plants) (10.9%), food (home-made canned meat) (10.6%), gas (carbon monoxide) (7.4%), pesticide (3.9%), alcohol (3.8%), and animal (snake, scorpion) (1.9%) poisonings. The percentage of poisonings of unknown origin was 6.7% (Table 3). A total of 1193 cases (78.4%) were suicidal while 328 cases (21.6%) were accidental. The female/male ratio was 7.5/3.4 below 15 years of age; 35/10 at 15-24 years, 16.9/6.4 at 25-34 years; 5.5/4.7 at 35-44 years, and 4.4/5.5 at 45 years and above. As the ages of the females increased, the percentage of poisonings decreased ( $p < 0.01$ ) (Table 4). The age group at risk was 15-24 years (45.7%). This group was followed by 25-34 years (23.3%) ( $p < 0.001$ ) (Tables 4, 5). To indicate the age groups at risk, the expected range of poisonings (the percentage of poisonings for each age

Table 3. Types of poisonings.

Types of poisoning	Number of cases (n)	%
Drugs	834	54.8
Herbs	166	10.9
Food	160	10.6
Poisoning gases	112	7.4
Pesticide	60	3.9
Alcohol	58	3.8
Animal	29	1.9
Undetected	102	6.7
Total	1521	100

Table 2. Distribution according to year of the population in Sivas.

Years	Population	Number of poisoning	Incidence (%)
1994	642,503	158	0.024
1995	636,332	255	0.040
1996	639,147	168	0.026
1997	618,050	413	0.066
1998	618,255	527	0.085
Mean	630,857	1521	0.048

range in the population of Sivas) was compared with the observed range of poisonings in our study (Table 6).

### Discussion

According to the reports of the Ministry of Health of the Turkish Republic, 27144 poisonings were admitted to hospitals throughout the country (5). The State Institute of Statistics in Turkey estimated that the population of Turkey was 63,250,000 in 1995 (6). Thus, the incidence of poisonings in Turkey can be estimated to be 0.043%. The population of Sivas between 1994 and 1998 was around 630,857 (7). In the Sivas region, the mean annual incidence of poisonings between 1994 and 1998 was 0.048%. This figure was the same as that of Turkey in 1995. During the period between 1994 and 1998, the number of women was almost twice that of men. Poisonings in the 15-24 age group formed almost half of all poisoning cases. In this group, most of the poisonings were suicidal. Similar data has been reported in different countries (8-10). The number of poisonings

Table 4. Distribution of poisonings according to age group and gender.

Age	Female n(%)	Male n(%)	Total n(%)
<15	114 (7.5)	52 (3.4)	166 (10.9)
15-24	532 (35)	163 (10.7)	695 (45.7)
25-34	257 (16.9)	97 (6.4)	354 (23.3)
35-44	84 (5.5)	71 (4.7)	155 (10.2)
≥45	7 (4.4)	84 (5.5)	151 (9.9)
Total	1054	467	1521

Table 5. Mean of dispersion of Sivas population according to age groups between 1994 and 1998.

Age groups	Population	%	over 1521 people
0-14	213,885	33.9	516
15-24	128,743	20.4	310
25-34	87,654	13.9	211
35-44	67,242	10.7	163
≥45	33,133	21.1	321
Total	630,857	100	1521

in the 15-24 and 25-34 age range was far higher than expected. The 15-34 age group seems to have a sheer tendency for being poisoned.

The most common factor in the poisonings was drugs in our study (54.8%). In a similar study, 63.6% of poisonings were drug-based (1). The most commonly ingested drugs were antidepressants (39%), analgesic-antiinflammatories (31%), antihypertensives (7%) and miscellaneous drugs (23%). Drugs were followed by herbal (10.9%), food (10.6%), gas (7.4%) and pesticide (3.9%) based poisonings. The commonest type of herbal poisoning was due to mushrooms. Additionally, herbs like "yemlik" (*polyganum cognatum*) and "madımak" (*scorzonera*) are generally mixed up with several detrimental plants while being picked, which especially increases the percentage of herbal poisonings in the countryside. A study conducted in Turkey reported that mushroom poisonings make up the majority of herbal poisonings (11). Food-based poisonings can be seen at a rate of 10.6% due to customary regional eating habits like home-made canned food and salted meat. Moreover, traditional coal stoves lead to carbon monoxide (CO) poisonings because of the long and hard winters in Sivas, the percentage of which is relatively high. This is supported by a study (12). Pesticide-related poisonings make up 3.9% of all poisonings since the Sivas region is an agricultural area.

We believe that our study will trigger necessary awareness which highlights the measures to be taken against poisonings. For example, in various studies, it is advised that when the packets of materials that may cause poisoning are emptied, they should not be re-used for any purpose. Those materials should be kept in their original packets. If unusable, they should be destroyed

Table 6. Distribution of observed and expected cases according to age groups.

	<15	15-24	25-34	35-44	≥45	Total (n)
Observed (n) (cases)	166	695	354	155	151	1521
Expected (n) (population)	516	310	211	163	321	1521

completely by throwing not into the rubbish but into the lavatory. It is also recommended that drugs should be kept locked in cupboards. They should have child resistant caps and necessary instructions within the containers if accidentally taken. Drugs should not be sold without prescriptions. The phone numbers of poison control centers should be easily available (13-16).

We recommend that additional strategies and measures can be developed in the Sivas region, based on our study:

- 1- To prevent suicidal poisonings, which form 78.4% of poisonings in Sivas, psychologists and psychiatrists should work in cooperation. Psychiatric support should be provided even within the smallest health care units.
- 2- Female adolescents in the rural areas should be well educated and given opportunities to have a profession.
- 3- People should be made aware of poisonous mushrooms and of what the result will be when eaten.
- 4- People should be made aware of the risk of mixing up commonly eaten herbs with detrimental plants while picking.
- 5- People should be warned to use coal stoves carefully on account of CO poisoning.
- 6- A project might be stimulated, every five years, to draw a poisoning profile in a specific region. Unless such a profile is attained, no proper way of coping with the types of poisonings in a particular region can be decided on.

## References

1. Karakaya A, Vural N. Acute poisoning admissions in one of the hospitals in Ankara. *Human Toxicology* 4: 323-6, 1985.
2. Özköse Z, Ayoğlu F. Etiological and demographical characteristics of acute adult poisoning in Ankara, Turkey. *Human & Experimental Toxicology* 18: 614-8, 1999.
3. Pınar A, Fowler J, Bond GR. Acute poisoning in İzmir, Turkey\_a pilot epidemiologic study. *J Toxicol Clin Toxicol* 31: 593-691, 1993.
4. Özyurt G, Tokyay N, Kucer N, Mutlu L, Önder I, Yılmaz D, Şenay O. Statistical report from Uludağ Poison Information Center-34-month experience. *Folia Med (Plovdiv)* 41(1): 101-3, 1999.
5. Health Statistics Yearbook 1996. Ankara: Republic of Turkey Ministry of Health, 1997.
6. Statistical yearbook of Turkey 1997. Ankara: State institute of statistics prime ministry, Republic of Turkey; 1998.
7. T.C. Sağlık bakanlığı Sivas ili Sağlık Müdürlüğü. 1998 yılı sağlık istatistikleri yılılığı, 1998.
8. Verstraete AG, Buylaert WA. Survey of patients with acute poisoning seen in the Emergency department of the University Hospital of Gent between 1983 and 1990. *Eur J Emerg Med* 2: 217-23, 1995.
9. Shepherd G, Klein-Schwartz W. Accidental and suicidal adolescent poisoning deaths in the United States, 1979-1994. *Arch Pediatr Adolesc Med* 152: 1181-5, 1998.
10. Schmidtke A, Bille-Brahe U, DeLeo D, Kerkhof A, Bjerke T, Crepet P, Haring C, Hawton K, Lonnqvist J, Michel K, Pommereau X, Querejeta I, Phillippe I, Salander-Renberg E, Temesvary B, Wasserman D, Fricke S, Weinacker B, Sampaio-Faria JG. Attempted suicide in Europe: rates, trends and sociodemographic characteristics of suicide attempters during the period 1989-1992. Results of WHO/EURO multicentre study on parasuicide. *Acta Psychiatr Scand* 93(5): 327-38, 1996.
11. Öztekin-Mat, A. Mushroom poisoning in Turkey. *Ann Pharm Fr* 56: 233-5, 1998.
12. Emri S, Barış B, L'Heureux P, Leduc D. Carbon monoxide poisoning related to the use of steam coal in poorly ventilated bucket stoves. *Eur J Emerg Med* 2: 92-5, 1995.
13. Berlin R. Poison prevention-Where can we make a difference? *Acad Emerg Med* 4: 1163-4, 1997.
14. Poison Prevention Week Council. 1997 Report on National Poison Prevention week: 1-31, 1997.
15. Litovitz TL, Klein-Schwartz W, Caravati EM, Youniss J, Crouch B, Lee S. 1998 annual report of the American Association of Poison Control centers Toxic Exposure Surveillance System: 17(5): 435-87, 1999.
16. Huott MA, Storrow AB. A survey of adolescents' knowledge regarding toxicity of over-the-counter medications. *Acad Emerg Med* 4: 214-8, 1997.