

OBSERVATION

CASES OF ACUTE POISONING ADMITTED TO CLINICAL HOSPITAL MERKUR IN ZAGREB IN 1999

INGRID PRKAČIN, SVETOZAR VUJANIĆ,
NIVES DABO, IVA PALČIĆ
AND SLAVICA NAUMOVSKI-MIHALIĆ

*Clinical Hospital Merkur, Zagreb,
Croatia*

Received March 2001

This paper describes 170 cases of acute poisoning in 60 men and 110 women admitted to emergency room from January through November 1999. Ninety-eight percent of acute poisonings were self-inflicted, and 90% occurred at home. Drugs were used in 134 (79%) suicide attempts. Eighty-one acute poisonings were caused by benzodiazepines (48%) and 19 by antidepressants (11%). Alcohol intoxication, alone or combined with the intake of psychoactive drug (28 cases, 16%) predominated in men. Cocaine was the most common narcotic drug, taken by 31 patients (16%). Other acute poisonings involved ecstasy (4 cases), CO (6 cases), and HCl inhalation (2 cases). Previous suicide attempts due to depression were found in 68 patients (40%). Fifty patients (29%) were comatose on admission, 24 were transferred to intensive care, and 3 died. Data such as these can be very useful for handling self-inflicted acute poisonings and for planning long-term health care activities.

Key words:

alcoholic intoxication, antidepressants, benzodiazepines, CO inhalation, cocaine, HCl inhalation, narcotic drugs

The clinical features and management of poisoning depend on the type of toxic agent, the severity of intoxication, and individual factors such as age, sex and health status. Among the drugs that are most often taken in overdose are benzodiazepines (1-5). Narcotic drugs can rapidly produce lethal outcome and are the most dangerous drugs when overdosed (6-8).

Literature about suicidal behaviour and the pharmacology of drug poisoning is quite extensive (7). The frequency of intentional acute drug poisoning and the involvement of the sexes vary from country to country (8). Urban areas may differ from rural areas, and socio-economic condition may also affect the patterns of drug intoxication (9).

Patients acutely poisoned with a drug, either intentionally or unintentionally, require immediate care, often followed by a long-term management of subsequent medical complications and emotional problems (10). Hospital emergency service is essential in cases of serious poisoning. For physicians and other health professionals who may encounter poisonings away from the hospital familiarity with the poison involved, manifestations of acute poisoning and diagnostic and treatment procedures are crucial in handling the patient.

SUBJECTS AND METHODS

This study relies on adult admissions to Clinical Hospital Merkur recorded between 1 January and 1 November 1999. The emergency room log was also reviewed to determine the total number of patients over the age of 15 years treated for all causes of poisoning and those specifically treated for drug poisoning. Hundred and seventy acutely poisoned patients (median age 31 years) were treated in the hospital, of whom 60 were men and 110 women.

Treatment of acute drug poisoning included gastric lavage; 141 patients received activated charcoal, and 10 were administered specific antidotes such as flumazenil. All psychoactive drug and alcohol poisonings were successfully managed using supportive therapy such as forcing renal excretion by hyperhydration. Naltrexone, a narcotic antagonist, was also used in the treatment of opioid overdosing. In the patients with CO inhalation oxygen was very slowly given in addition to supportive therapy. Patients with laryngeal stenosis caused by HCl inhalation were treated surgically.

RESULTS AND DISCUSSION

Table 1 summarises data about patients hospitalised in Clinical Hospital Merkur in Zagreb due to acute poisoning. Of 170 patients 110 were women aged 15-75 years (most between 20 and 44) whereas the 60 male patients aged 17-75 years (most between 17 and 30). Self-inflicted acute poisoning was found in 168 cases (98%). Ninety percent of acute poisonings occurred at home. Distribution of admissions due to poisoning with analgesics, antidepressants, and benzodiazepines by age and sex was not different from that for overall poisoning.

Drugs were used in all 134 (79%) suicide attempts. The incidence of benzodiazepine and antidepressant poisonings was 81 (48%) and 19 (11%) cases, respectively. It appears

Table 1 Patients admitted to Clinical Hospital Merkur in Zagreb, Croatia for acute poisoning from 1 Jan to 1 Nov 1999

Clinical data		Number of patients	(%)
Patients treated	Men (17-75 years)	60	(35)
	Women (15-75 years)	110	(65)
	Total (median 31 years)	170	(100)
Type of poisoning	Suicidal	134	(79)
	Accidental	26	(15)
	Occupational	6	(4)
	Unknown	4	(2)
Poison involved	Benzodiazepines	81	(48)
	Antidepressants	19	(11)
	Alcohol abuse	18	(11)
	Alcohol and drugs	10	(6)
	Cocaine and other narcotics	31	(18)
	Ecstasy	4	(2)
	Carbon monoxide inhalation	6	(4)
	Hydrochloric acid intake	2	(1)
Depression as the cause of suicidal attempt		68	(40)
Repeated suicidal attempt		24	(14)
Coma on admission	Cocaine intoxicated	31	(19)
	Benzodiazepine intoxication	11	(6)
	Alcoholic intoxication	8	(5)
	Total	50	(29)
	Continued on intensive care	24	(14)
Duration of hospitalization	<1 days	146	(86)
	2-7 days	21	(12)
	>10 days	3	(2)
Fatal outcome		3	(2)

that the major determinant of the incidence of a particular drug as an agent in acute poisoning is its availability. Overdosing with diazepam was the most common, which probably reflects its widespread use as a tranquilliser (2-5). However, acute benzodiazepine poisoning is rarely life-threatening if ingested as the sole agent.

Eighteen (11%) patients were admitted due to excessive alcohol abuse, and 10 (6%) used a psychoactive drug with alcohol. Cocaine was the most common agent in 31 (18%) cases of narcotic poisoning found mostly in men (20 patients) aged between 15 and 25 years. Four acute poisonings were caused by ecstasy. Acute poisoning due to carbon monoxide inhalation was found in 6 patients (3%). Two women attempted suicide by HCl intake and they underwent surgery. Poisonings with pesticides were not recorded.

There were no seasonal variations related either to the number of hospital admissions or to the number of emergencies due to drug poisoning. The duration of hospitalisation

of poisoned patients range 1 to 46 days. One hundred and forty-six patients were hospitalised for less than 24 hours, of whom 70 for less than 12 hours. Significant complications occurred in three patients who were hospitalised for 20-46 days.

Fourteen patients under and ten over 30 years of age were transferred to the hospital ward. Our analysis did not confirm the increased rate of hospitalisations of patients over 40 years reported in other studies (1,5).

In our study, suicide attempts were due to depression in 68 (40%) patients. Several features are noteworthy when analysing differences in suicide attempts between the sexes and age groups. Studies indicate that the attempted suicide rate is higher for women than men and that the latter have three times as high completed suicide rate as women (5, 10, 12). Men who attempted suicide are often diagnosed schizophrenia and psychopathic condition whereas women who attempted suicide are often diagnosed to suffer from affective disorders and psychoneuroses (1). Women are more likely to have received psychiatric treatment prior to the suicidal act. It appears that men are more determined in attempting suicide than women (12, 13). Women, in turn, repeat suicidal attempts more often than men (10). It has been noted that women are much more likely to attempt suicide with drugs than men (11). Older patients may be more determined to complete the suicidal act while poisoning in younger patients may often represent a suicidal gesture. Older patients may also be less able to cope with the physiologic stress of drug overdose (10).

Twenty-four patients (14%) had a history of previous suicide attempts, which we established through the interview with patients and/or through previous hospitalisation records. One patient attempted suicide three times and one as many as eight times. One patient reported a long history of drug overdose attempts that were "too numerous to count". By the time this study was completed, two discharged patients made attempted suicide again. Eighteen patients were under the care of a psychiatrist immediately prior to the episode of acute drug poisoning. Patients acutely poisoned with drugs who did not need significant medical treatment, but showed serious suicidal tendencies, were often transferred to a mental institution.

Cardiovascular complications were common among the patients. Seven had diastolic hypertension (above 90 mm Hg), while 84 patients were hypotensive (diastolic blood pressures below 100 mm Hg). Tachycardia with the pulse above 100 bpm was observed in 10 patients and bradycardia with the pulse below 60 bpm was observed in one woman. Hypotension is to be expected, having in mind many sedatives, tranquillisers, and antidepressants available to the suicidal patient. It is a common complication in acute poisoning with meprobamates, chlor-diazepoxides, phenothiazines and tricyclic antidepressants (9).

Respiratory depression was seen in six patients. Two were apnoeic at the time of admission and four had respiratory rates of less than 10/min. Six patients showed signs of pneumonia, which were confirmed by chest x-ray. *Klebsiella* and *Haemophilus influenzae* were found in the sputum of two patients and *Staphylococcus aureus* of one patient. Four of six patients with leukocytosis had pneumonia, and two patients with pneumonia had normal white blood cell count. Major motor seizures developed in two patients. One patient developed a motor/sensory deficit of the upper extremities and one acute renal failure after alcohol abuse.

The presence of leukocytosis in patients acutely poisoned with drugs often points to

a coexistent infectious process. A mild increase in white cell count was common in our patients as a result of drug ingestion. Stress of various forms such as convulsive seizures, strenuous exercise, or agitation have been observed to induce leukocytosis and may account for elevated white blood counts in acute drug poisoning (13).

Fifty patients (29%) were comatose on admission to the emergency room; 31 (19%) were poisoned with cocaine, 11 (6%) with benzodiazepine, and eight (5%) with alcohol. Of those 50 patients, 24 were admitted to the intensive care unit: ten poisoned with cocaine, nine with drugs, and five with alcohol.

Two men and one woman died, all from poisoning with antidepressants. They were over 70 years and the cause of death was ventricular arrhythmia and respiratory depression. In general, hospital mortality is lower than 1% of all admissions (12). However, it should be emphasised that most acutely poisoned patients die at home.

CONCLUDING REMARKS

The number of acute poisonings we analysed in this study remained virtually constant over the 10-month period, despite a great variation in drugs abused. The findings suggest that persons who are determined to attempt suicide will resort to what is easily available. The epidemiology of overdosing with benzodiazepines and antidepressants does not appear to be different in any way from that of poisoning in general. A trend of rising morbidity and mortality caused by these drugs most probably reflects their increased use and general availability.

Intentional and unintentional acute drug poisoning is on the rise. Awareness of medical, psychological, and social background is important in order to effectively deal with each patient.

REFERENCES

1. Caballero Valles PJ, Dorado Pombo S, Brusint Olivares B, Jerez Basurco B, Medina Sampedro M. The epidemiological surveillance of acute poisoning in 1997. *Rev Clin Esp* 1999;199(7):424-30.
2. Gaudreault P, Guay J, Thivierge RL, Verdy I. Benzodiazepine poisoning. *Drug Safety* 1991;6:247-65.
3. Shalansky SJ, Naumann TL, Englander FA. Therapy update: effect of flumazenil on benzodiazepine-induced respiratory depression. *Clin Pharmacol* 1993;12:483-7.
4. Chern TL, Hu SC, Lee CH, Deng JF. Diagnostic and therapeutic utility of flumazenil in comatose patients with drug overdose. *Am J Emerg Med* 1993;11:122-4.
5. Chodorowski Z, Sein Anand J. Suicidal poisoning with benzodiazepines. *Przegl Lek* 1997;54:416-9.
6. Lobl JK, Carbone LD. Emergency management of cocaine intoxication. Counteracting the effects of today's "favorite drug". *Postgrad Med* 1992;91:161-2.

7. Salvucci AA Jr, Eckstein M, Iscovich AI. Submental injection of naloxone. *Ann Emerg Med* 1995;25:719-20.
8. Doyon S, Roberts JR. Reappraisal of the "coma cocktail". *Emer Med Clin North Am* 1994;12:301-16.
9. Bajo Bajo A, Santos Perez ME, Sanz Ortega F, Zapico Alvarez N, Okatsu KT, Garcia Perez A, Borra Beato R. An epidemiological study of acute intoxications and provision of medical-cabinet antidotes. *An Med Interna* 1999;16(6):285-9.
10. Nordentoft M, Breum L, Munck LK, Nordestgaard AG, Hunding A, Laursen Bjaeldager PA. High mortality by natural and unnatural causes: a 10 years follow up study of patients admitted to a poisoning treatment center after suicide attempts. *BMJ* 1993;306:1637-41.
11. Pinero-De Fuentes S, Medina-Orozco E, Rojas M. Prevalence of drug abuse in patients receiving care in adult emergency. *Salud Publica Mex* 1998;40:234-40.
12. Fingerhut LA, Cox CS. Poisoning mortality, 1985-1995. *Public Health Rep* 1998;113:379-80.
13. Billy F, Montaz L, Perault MC, Vandel B. Study of voluntary drug intoxication in an emergency unit. *Therapie* 1998;53(6):553-8.

Sažetak

**AKUTNA OTROVANJA U BOLESNIKA LIJEČENIH U KLINIČKOJ BOLNICI
“MERKUR” U ZAGREBU TIJEKOM DESET MJESECI 1999. GODINE**

Analizirano je 170 slučajeva akutnih otrovanja u 60 pacijenata i 110 pacijentica (srednja dob 31 godina) koji su obrađivani u Hitnoj internoj poliklinici Kliničke bolnice “Merkur” u razdoblju od 1. siječnja do 1. studenoga 1999. U 168 (98%) pacijenata otrovanje je bilo namjerno izazvano. Devedeset posto otrovanja dogodilo se kod kuće. U 134 (79%) pacijenata samoubojstvo je pokušano lijekovima. Uzrok akutnog otrovanja u 81 (48%) bili su benzodiazepini, a u 19 (11%) slučajeva antidepresivi. Pretežiti uzrok otrovanja u muškaraca bio je alkohol (u 18 slučajeva, 11%) ili kombinacija alkohola i psihoaktivnog preparata (u 10 slučajeva, 6%). Narkotici su bili uzročnici akutnog otrovanja u 31 (18%) pacijenata i među njima bio je najzastupljeniji kokain. Ostali uzročnici akutnog otrovanja bile su sintetske droge kaoecstasy (3 slučaja, 2%) te udisanje ugljičnog monoksida (6 slučajeva, 4%) i klorovodične kiseline (2 slučaja, 1%). U 68 (40%) pacijenata pokušaj suicida bio je posljedica depresije. Prethodnih suicidalnih namjera bilo je u 24 (14%) pacijenata. Na prijemu u Hitnu internu polikliniku bilo je ukupno 50 (29%) komatoznih pacijenata, a uzrok otrovanja kokain u 31 (18%), benzodiazepin u 11 (6%) i alkohol u 8 (5%) slučajeva. Od tih pacijenata na daljnjem tretmanu u Jedinici intenzivne njege zadržana su 24 pacijenta. Smrtni ishod zabilježen je u troje pacijenata visoke dobi (više od 70 godina) koji su se otrovali antidepresivima, a uzrok smrti bile su ventrikularna aritmija i respiratorna depresija. Rezultati ovog istraživanja daju korisne podatke kako za pružanje neposredne medicinske skrbi tako i pri planiranju zdravstvene zaštite u namjerno izazvanim akutnim otrovanjima.

Ključne riječi:

antidepresivi, benzodiazepini, klorovodična kiselina, kokain, otrovanje alkoholom, sintetske droge, ugljični monoksid

Requests for reprints:

Ingrid Prkačin, M.D., Ph.D.
Department of Internal Medicine,
Clinical Hospital Merkur
Zajčeva 19, HR-10000 Zagreb, Croatia