

An Epidemiologic and Demographic Survey of Poisoning in Southwest of Iran

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Abstract: Medicinal and non-medicinal poisoning are serious problems worldwide and the second cause of death following infection. The purpose of this study was to investigate the epidemiologic and demographic characteristics of intoxicated cases admitted to Razi Hospital in Ahvaz County, Iran. It was a descriptive study performed on 840 intoxicated admissions to Razi Hospital between March 2007 and February 2008. Data was collected in questionnaires, by observation and patient interviews. The collected data was coded, computerized and analyzed with SPSS software. The study population included 60.2% male and 39.8% female. The majority of patients aged 21-25 years (34.5%) and 16-20 years (22%). Non-medicinal figures with statistics were (50.4%) and medicinal agents were (47.5%). Attempted suicide accounted for 59.6% of cases and accidental exposure was the cause of intoxication in 40.4% of them. The study group was comprised of 60.1% single and 39.9% married. Urban cases were recorded at 91.3% and the rest from rural areas. The highest incidents were referred in summer (38%) and the lowest in autumn (14.8%). This study showed that scorpion stings are the main cause of poisoning among non-medicinal agents; and tranquilizers are the main cause of intoxication in medical agents. Of all narcotics poisoning referrals, Opium was ranked first at 37.8%. In conclusion, to decrease the rate of incidents in poisoning centers, we need to choose a management system which will educate people how to reduce contact with toxic agents.

Key words: Hospital • Intoxication • Epidemiology • Demography • Ahvaz County • Iran

INTRODUCTION

Medicinal poisoning and non-medicinal poisons are common medical emergencies and major public health problems around the world. In 2003 the U.S Poison Control Centers received more than 2.4 million reports of toxin exposure, of which 76% were by oral ingestion. Most importantly 93% occurred in the home of which 80% were unintentional. These figures have shown that developed countries experience the same toxin difficulties as developing countries [1]. The number of deaths involving prescription Opioid analgesics increased from approximately 2,900 in 1999 to 7,500 in 2004, an increase of

160% in just 5 years in the U.S [2]. In a study in Spain, childhood poisoning accounted for 0.28% of all emergency visits during survey period [3]. Based on an evaluation in the Emergency Department of Internal Medicine Training and Research Hospital at Haseki Istanbul, medicines were the most common cause of poisoning (74.2%), which was followed by carbon monoxide (8.7%) and alcohol (8.4%). Poisoning was deliberate in 73.5% and accidental in 25.6% of the cases [4]. Excessive alcohol intake is a major cause of premature Russian male mortality, although many alcohol-related deaths are wrongly attributed to diseases of the circulatory system [5]. Research in Iran showed poisoning

is the fifth unintentional cause of death in children under four [6]. A survey at a hospital in Tehran, the capital of Iran, showed 51% of the poisoning cases were male and the majorities (38%) of cases were in the age range of 21-30 years. For the most part 79% of poisonings were intentional and 21% were unintentional. The most important agents of acute poisoning were medicines (69.13%) especially sedative-hypnotics followed by Opioids (12.34%) and pesticides specifically organophosphates (OPs) (6.21%) [7]. The remaining poisoning agent in Iran which has been used for suicide and unintentional poisoning is aluminum phosphide, a fumigant that releases toxic phosphine when it comes into contact with moisture. It is the most common rice tablet used in Iran to protect stored grains and rice from rodents and pests. A two year epidemiological survey of aluminum phosphide poisoning in Tehran showed that of 340 cases, (68.2%) which were referred in the second year, one hundred (29.4%) of the patients died, most of them were females (59%). There was no significant correlation between sex, age and outcome [8]. To determine the causes and mortality of poisoning due to pesticides, a survey was carried out in Loghman-Hakim Hospital Poison Center in Tehran (1995-1997). Organophosphates were the main cause of pesticide poisoning and pesticide-related deaths in Iran; 95% of the events were intentional and there were seasonal variations of poisoning events with a higher frequency in the spring (39%) and (35%) in summer [9].

Poisoning is generally unintentional by children but their parents play a critical role in their intoxication especially in infants under one year of age [10].

Food poisoning is another cause of poisoning in Iran. Of the 72,421 poisoning cases admitted to Loghman-Hakim Hospital Poison Center in Tehran, from 1992 to 2002, only 37 were poisoned by consumption of toxic mushrooms [11]. Food-borne botulism poisoning is also a health problem with a variable prevalence rate in Iran. From 2004 to 2008 there were 341 suspected cases of botulism recorded in Iran [12]. In a survey of child poisoning at Kerman in Iran, the season had significant effect on poisoning and most cases were referred in winter ($p < 0.001$); also there were less recorded cases of children of educated parents in comparison with others which was significant ($p < 0.001$). The causes of poisoning were medicine (34.7%), narcotic agent (26.7%), food poisoning (14.9%), stinging (10.3%), petroleum and its products (6.5%), hygienic materials (4.8%) and finally insecticide (1.5%) [13]. Various kinds of fish; salted, smoked and canned, also canned green beans and cucumber are

causative agents of food-borne botulism recorded in some medical centers in Tehran and other areas of Iran, between April 1984 and August 1994 [14]. In Iran, the greatest proportion of poisoning occurs in youth and medicine plays an important role in acute poisoning [6, 15-17]. A study of self-poisoning among students admitted to Loghman-Hakim Hospital in Tehran, Iran, showed, self-poisoning with a pharmaceutical agent was the most common attempt of suicide (87.5%).

In this study, intoxicated referrals to Razi Hospital in Ahvaz were investigated demographically and epidemiologically. The causes of poisoning and distribution were studied; the results of which could be considered in the design of prevention and management of poisoning programs.

MATERIALS AND METHODS

This is a descriptive study which was performed on 840 intoxicated admissions to Razi Hospital between March 2007 and February 2008. Data was collected by interview, examination and questionnaires. Factors examined included age, sex, marital status, type of toxic agent, whether intentional or accidental poisoning, place of residence (urban or rural), outcome (death or recovery), occupation, town/city, month, season. The collected data was coded, computerized and analyzed using SPSS software.

RESULTS

The studied population included 60.2% male and 39.8% female. The majority of patients aged 21-25 years (34.5%) and 16-20 years (22%). While, minority of cases aged 0-15 years (2%), 41-45 years (4.7%) and 46-50 years (3%) (Figure 1). Unintentional exposure was the cause of intoxication in 40.4% of the cases but 59.6% had attempted suicide. Patients used the following substances for poisoning: non-medicinal (50.4%), medicines (47.5%), non-medicinal and medicines (1.7%) and finally unknown (0.4%) (Table 1). The causes of non-medicinal poisoning were scorpion sting (45%), snake bite (22.7%), other bites (10.9%), narcotics (10.9%) and insecticides (6.9%) (Table 2). It was recorded that 78.8% of scorpion stings were attributed to the yellow scorpion and 21.2% to the black ones. It was shown that 44.4% of scorpion stings occurred on the hand, 22.2% on feet and 30.6% on the other parts of the body (Figure 2). Similarly, 56.5% of snake bites occurred on feet and 43.5% were on hands. Tranquilizers accounted for 34.9% of used medicines,

Table 1: Frequency of the causes of poisoning in Razi Hospital (2007-2008)

Non-Medicinal poisoning	Number	Percent
Medicine	398	47.5
Non-Medicinal	423	50.4
Unknown	3	0.4
Medicine and Non-Medicinal	14	1.7
Total	840	100

Table 2: Distribution of the causes of non-medicinal poisoning in Razi Hospital (2007-2008)

Non-Medicinal Poisoning	Number	Percent
Scorpion Sting	190	45
Snake Biting	96	22.7
Narcotic	46	10.9
Biting	46	10.9
Insecticide	29	6.9
Unknown	4	0.9
Detergent	3	0.7
Petroleum	2	0.5
Gas	2	0.5
Poisonous Plant	1	0.2
Food Poisoning	1	0.2
Petroleum & Narcotic	1	0.2
Insecticide & Detergent	1	0.2
Insecticide & Poisonous Plant	1	0.2
	423	100

Table 3: Distribution of intoxicated referrals to the Razi Hospital based on month (2007-2008)

Month	Number	Percent
January	42	5.0
February	52	6.2
March	44	5.2
April	74	8.9
May	95	11.3
June	89	10.6
July	107	12.7
August	128	15.2
September	84	10.0
October	35	4.2
November	58	6.9
December	32	3.8
	840	100

other drugs were 8.8%, Tramadol (13.6%) and other pain killers (Analgesic) (7.5 %); in this category tranquilizers were most frequently used (Figure 3). Attempted suicide (59.6%) and accidental exposure (40.4%) were the cause of intoxication. The study group was comprised of 60.1% single and 39.9% married. The majority of cases (91.3%) were urban and the others from rural areas. Meanwhile, many of the cases were referred in summer (38%) and least of them admitted in autumn (14.8%) (Table 3 and Figure 4). The majority of cases were made up of conscripts (34.9%) and housewives (28%) (Figure 5). The highest incidence

Table 4: Distribution of intoxicated referrals to the Razi Hospital based on geographic position in Khuzestan Province (2007-2008)

Towns of Khuzestan Province	Number	Percent
Ahvaz	700	83.3
Ramhormoz	26	3.1
Bagh Malek	18	2.1
Hoveizeh	12	1.4
Haftgol	10	1.2
Shadegan	9	1.1
Shooshtar	9	1.1
Soosangerd	8	0.9
Shoosh	7	0.8
Omidieh	6	0.7
Masjed Soleiman	5	0.6
Unknown	5	0.6
Dezfool	4	0.5
Andimeshk	4	0.5
Lali	3	0.4
Eizeh	3	0.4
Bostan	3	0.4
Mahshar	3	0.4
Dashte Azadegan	2	0.2
Abaadan	2	0.2
Behbahan	1	0.1
	840	100

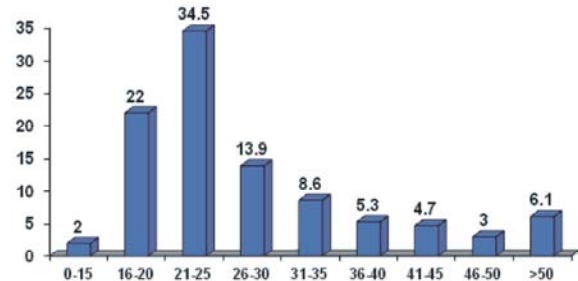


Fig. 1: Distribution of intoxicated referrals to the Razi Hospital based on age (2007-2008)

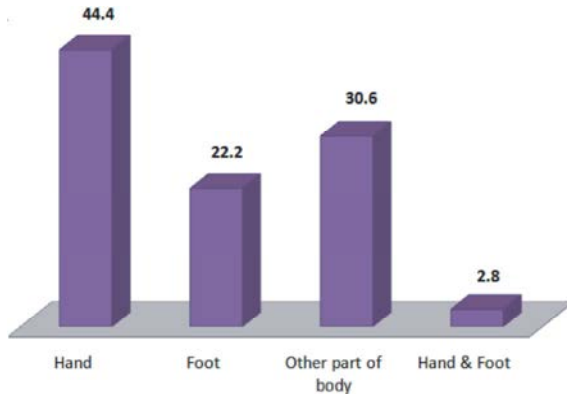


Fig. 2: Distribution of different parts of the body stung in intoxicated referrals to the Razi Hospital (2007-2008)

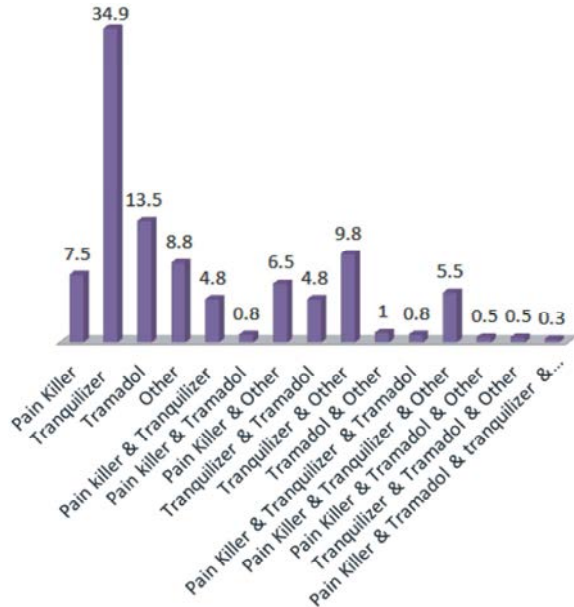


Fig. 3: Distribution of intoxicated referrals to the Razi Hospital based on medicine (2007-2008)

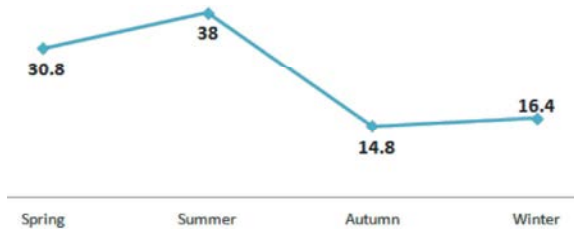


Fig. 4: Distribution of intoxicated referrals to the Razi Hospital based on season (2007-2008)

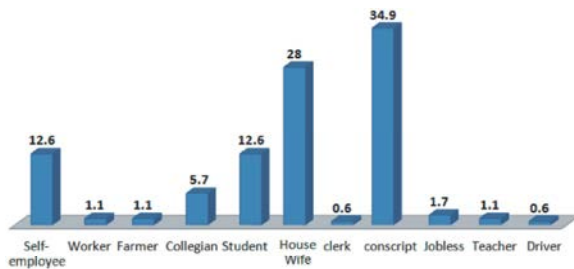


Fig. 5: Distribution of intoxicated referrals to the Razi Hospital based on occupation (2007-2008)

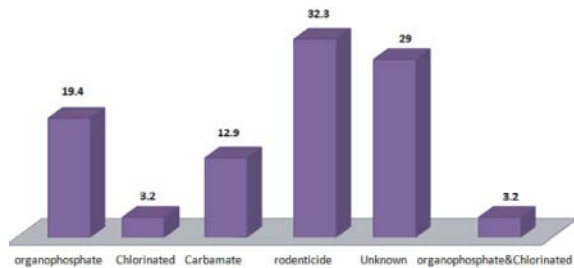


Fig. 6: Distribution of intoxicated referrals to the Razi Hospital based on insecticide (2007-2008)

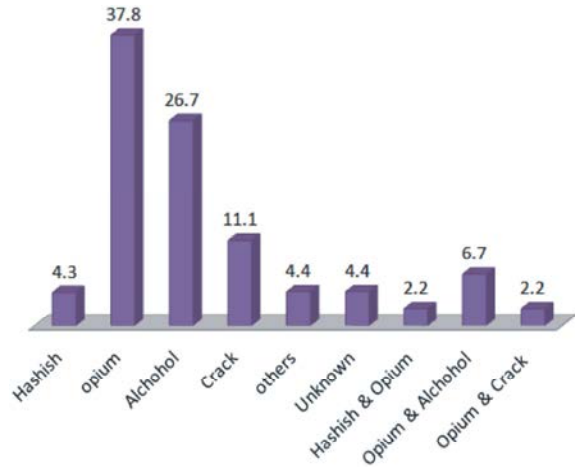


Fig. 7: Distribution of intoxicated referrals to the Razi Hospital based on used Narcotics (2007-2008)

of pesticide poisoning was by rodenticide (32.3%). Organophosphate, Carbamate and unknown showed 19.4, 12.9 and 29%, respectively (Figure 6). In (Table 4) distribution of intoxicated referrals to the Razi Hospital based on geographic position in Khuzestan Province has been shown. Opium was ranked first in narcotics poisoning agents (Figure 7). Of the 840 patients only one died.

DISCUSSION

In this study, a total of 840 intoxicated patients were referred to Razi Hospital in Ahvaz between March 2007 and February 2008; the highest incidence of poisoning occurred in men; the male: female ratio in the study was; 3 to 2. In a study carried out in Taleghani Hospital at Urmia located in north western Iran during 2001-2004, 54.9% of poisoned people were female and 45.1% were male [18]. In toxicological studies in Loghman-Hakim Hospital in Tehran, 62.6% of admitted poisoned cases were female and 37.4% were male [19]. The results of these studies were inconsistent with our investigation, but it should be noted that these studies are only about chemical and pharmacological poisoning cases. The second study (Loghman Hakim Hospital) also discussed suicide attempts which are more prevalent in women than men [19].

A study in Kermanshah Razi and Shahid Fahmideh hospitals located to the west of Iran, 61% poisoned children were male [20]. In Shaheed Beheshti Hospital of Kashan, during 1997-2001, the poisoned referrals in boys were nearly twice as often as girls [21]. In a survey in

Isfahan and Tehran most of the cases were boys [7, 22]. The result of these studies is consistent with our investigation, which shows greater prevalence of poisoning among boys. This could be due to the adventurous and more active behavior of the boys. These boys' parents, especially in rural areas, pay little attention to boys so they are more exposed to toxic products which are available in their environment.

The present investigation showed differences between marital status and frequency of intoxication. Poisoning was more common in single cases; this could be due to existence of behavioral disorders, social factors, irritability, easy access and psychological crises in singletons, in comparison to those married.

In a survey, intentional abuse (poisoning) or unsuccessful attempted suicide was (61.9%) in single people; the majority of people in this group were women [23].

Vazirian *et al.* [20] reported that the cause of poisoning in 59.9% of cases is unintentional. At Tabriz, a survey showed that most intoxication in infants of less than 6 months was caused by parents' intentional use of opium as a means to pacify infants [24].

In this investigation, 767 cases (91.3%) lived in cities and 73 cases (8.7%) lived in villages. In a study in Kermanshah Razi and Shahid fahmideh hospitals, 75% of poisoning cases lived in cities and the rest lived in rural areas [20]. In a hospital at Kashan located in centre of Iran, 68.9% of patients were urban residents and 31.1% were rural residents [21]. In Imam Reza Hospital at Mashhad, located in the east of Iran, study of attempted suicide cases showed that 83.7% of them are related to the urban areas [25]. The reason for higher prevalence of poisoning in urban areas could be that there is more access to toxic substances and drugs, especially psychotherapeutic drugs. Another reason could be due to more stressful life in cities and industrial living. There appears to be less referral of rural cases to urban medical centers for treatment after ingesting poisonous materials. The lower rural poisoning cases could be down to the fact that many cases may not be reported to the medical authorities.

Poisoning rates are highest in youth at ages 20-30 years [9, 26]. The majority of suicide attempts occur in families with low educational standards even when faced with minor difficulties. The major difficulties such as lack of employment, feeling of hopelessness, loneliness and no plan for the future life due to recent global recession might be others reasons for attempted suicide.

High poisoning among conscripts (34.9%) can be linked to the suicide rates of young people from 20-30 years for the reasons given previously, however, due to the environment in which they are expected to carry out military training they are prone to environmental poisoning by snake bite, scorpion sting etc. The second frequency was housewives with 28% of total cases possibly due to their choices for employment are reduced and they are prone to neurosis because of a life full of stress while supporting other family members. In a study which was carried out in the north of Iran at Mazandaran province, psychiatric patients specially the young adults, females and married people were among the high risk cases [27]. Yamasaki *et al.* [28] showed that correlation between unemployment and attempted suicide in men with socioeconomic factors as well as neurobehavioral variables is significant.

This study illustrated that most of the cases are referred in summer and minimum in autumn, in a study which was carried out in the west of Iran; the results were very similar [20]. Our investigation also showed that the high incidence of poisoning generally occurs in the summer, possibly because most patients contact with the environment is easier, as the population mobility is high and poisonous animals are more active.

Follow up of the referral patients showed that one patient in the study had died. In a study which was carried out in a hospital in capital of Iran over 18 months, the overall mortality was 7% due to pesticide poisoning [9]. In the US in 2008, the number of poisoning deaths exceeded the number of motor vehicle deaths and was the leading cause of injury death for the first time since at least 1980 [29]. During the past three decades, the poisoning death rate nearly is tripled, while the motor vehicle traffic death rate decreased by one-half [29]. Our investigation showed that poisoning death rate in Iran is low, in comparison to the statistics of other countries.

In this study, non-drug toxicity was slightly higher than that of drug agents, which is consistent with obtaining results by Ghorashi and Sultani ahari [24]. Tranquilizers are frequently responsible for drug poisoning (34.9%), as shown in another survey (40%) [21].

In a study about medication (especially benzodiazepines) and non-medication poisoning; opium/hashish and kerosene were the most commonly ingested agents [22]. A high percentage of drug

poisoning in our country may be dependent on inappropriate drug consumption [30], lack of proper packaging by drug manufacturers, poor storage by families or the sharing of medication.

In our survey, the high incidence of pesticide poisoning was attributed to rodenticide (32.3%), organophosphate (19.4%), Carbamate (12.9%) and unknown (29%). Organ phosphorus compounds are consumed in the majority of poisoning cases, usually used to commit suicide, as investigated in research in India (84.3%) [31]. Organophosphates are the main cause of pesticide poisoning and pesticide-related deaths in Iran [9]. In our study, the low incidence of toxicity with organ chlorines may be related to import restriction or the fact that pesticides have restricted usage in cities. A more simple explanation is that organ phosphorus compounds are more freely available than organ chlorines [32]. Inconsistencies of this investigation with others may be due to environmental differences in epidemiological and demographical conditions.

This study showed that poisoning in males are more common than in females and most patients aged 15-25 years. Toxicity of pesticides should be considered very seriously and medical personnel must familiarize themselves with the symptoms of pesticide poisoning in order to use the correct antidotes. Parents should be educated in the safe use and storage of poisonous materials ensuring inaccessibility to children.

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