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Investigation of Deaths Caused by Poisoning in Razi Educational-Therapeutic-Research Hospital in Northern Iran during the Years 1390-1394

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ABSTRACT

Background
The development of experimental science had resulted in more access to drugs and chemicals, which consequently has caused many problems. Poisons, whether pharmaceutical or chemical, can lead to the death of people who are severely poisoned. In this study, we investigated the cause of deaths in the poisoning department of educational-therapeutic centers during 1390 and 1394.

Materials and Methods
In this cross-sectional study, all records of patients visiting the poisoning department of Razi Hospital in Rasht from the beginning of 1390 until the end of 1394 were analyzed who were hospitalized in this center after being diagnosed with poisoning and then died.

Ethical Considerations
Honesty and fidelity in writing the text have been observed.

Findings
In this study, the most common cause of death was related to opioids; on the other hand, deaths caused by opioids can be prevented to a great extent. Therefore, it is necessary to consider therapeutic policies for developing facilities, timely diagnosis and providing proper and careful care in order to reduce mortality rates due to poisoning with these substances.

Conclusion
In this study, 330 patients died from poisoning (including 226 males and 104 females) were examined. The highest percentage of deaths belonged to married people who died of poisoning (80.3%). 44.8% of people who died of poisoning had a history of drug addiction. 95.5% of patients who died in poisoning department tried to commit suicide. The most common cause of death was related to opium consumption (21.2%), followed by methadone consumption (17%) and then consumption of rice tablet (aluminum phosphide, 14.8%).

Key words
Poisoning, Death, Suicide.

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INTRODUCTION

Poisoning is one of the most common causes of admitting to emergency rooms. Every year many people get mildly sick, hospitalized in Intensive Care Unit (ICU) or even die from intentional or accidental poisoning which imposes a great deal of burdens in terms of economy and also mental and physical health on society, families and individuals [1]. The advancements in technology and the development of empirical sciences have resulted in more access to medicines and chemicals and the widespread use of these drugs and agricultural and industrial substances, which consequently has led to many problems [7],[14]. In 2003, more than two million cases of poisoning were reported in the United States which was the cause of more than 920 deaths and 475,000 hospital admissions [2],[5],[8],[11]. Unfortunately in recent years, the percentage of intentional poisoning has increased (25.24). In UK, the trend of intentional poisoning has increased over recent years and has become one of the major causes of emergency medical care in the country [4],[5],[6],[7],[8]. In developing countries, exposure to poison is one of the most important causes of acute medical illnesses [9]. so that the intentional poisoning is the cause of more than 60% of deaths in all the poisoning cases in Asia [10].

Based on current statistics in Iran, approximately 30,000 people in Tehran are poisoned annually because of using drugs and chemicals, 12,000 of whom are hospitalized, and 1200 of them are transferred to ICU, of whom at least 120 people die. According to the statistics of Iranian Legal Medicine Organization, only in the first nine months of 2007, 383 people died due to drug poisoning; also, 602 people died of poisoning by chemical and toxic substances. These statistics also have revealed that that the most common method of suicide in our country is using drugs and poisons [12],[13]. Also the studies in northern Iran show that the most frequent cases of poisoning occurred during the ages of 16 to 25 and most of them were accidental caused by drugs, rat poison (Rodenticide) and oil. Poisoning with insecticides is the leading cause of death [16].

A study showed that the percentages of poisoning with different substances are as follows: alcohol (11%), antidepressants (32%), painkillers or analgesics (20%), antibiotics (10%), benzodiazepines (9%), salicylates and cardiovascular drugs (7%). It also showed that the mortality rate was less than 1% [15]. In another study, the most frequent cases of insecticide poisoning were among young adults and 84% of these cases were suicide attempts. Also, 18% died of using Paraquat herbicide and endosulfan insecticide [11].

Epidemiologic recognition of common drugs and poisons in poisoning in order to help providing correct and timely treatments can lead to the survival of a poisoned person and

preventing his/her death. Considering the cultural difference and regional texture in the country and the impact of environmental factors on poisonings, the abundance and availability of drugs and chemical substances and also substance abuse and drug addiction in the province which has resulted in many cases of poisonings and deaths, this study has been conducted to investigate deaths caused by poisoning in the poisoning department of Razi Hospital during 1390-1394.

MATERIALS AND METHODS

In this retrospective study, all records of patients visiting the poisoning department of Razi Hospital in Rasht from the beginning of 1390 until the end of 1394 were statistically investigated and analyzed who were hospitalized in this center after being diagnosed with poisoning and then died. The required information was collected by checklist based on the documentation available in the records of patients who were intentionally or unintentionally poisoned by using drugs and poisons.

Various items were evaluated in information forms, including age, sex, occupation, type of used drug, time of use, complications leading to death and so on.

Complications were identified based on organ involvement, patient's symptoms, death table, and side effects of used drug or poison that were expected to appear in patient.

Information was entered into SPSS software version 21, and the results were presented in tables as frequencies and percentages for the purpose of explanation. Also Fishers Exact Test was used for presenting the results as well.

FINDINGS

In this study, 330 patients died of poisoning (including 226 males and 104 females) were examined who were admitted to the poison department of Razi Medical Education Center in Rasht during the years of 1390-1394.

The highest percentage of admitted patients who died of poisonings belonged to the age group of more than 70 years old (22.1%), followed by patients aged 30-40 years (18.2%) and then the age group of 20-30 years old (17.3%). The highest percentage of deceased patients were married (80.3%). The highest percentage of patients who died of poisoning lived in Rasht city (59.4%) as well as other cities in Gilan province (40.6%). The most common way of poisoning leading to death was oral consumption (89.7%).

The highest percentage of deaths in the poisoning department belonged to unemployed men and then housewives (Table 1).

Table 1 - Frequency distribution of employment Status of patients who died in the poisoning department of Razi Hospital

Employment status	Number	Percent
Workers	63	19/1
Employees	46	13/9
Students	26	7/9
House wives	88	26/7
Unemployed men	107	32/4
Total	330	100

44% of patients who died of poisoning were addicted to drugs. 46.4% of patients who died of poisoning had a history of underlying diseases. 95.5% of patients who died of poisoning committed suicide and the other 4.5% were unintentionally poisoned and died.

54.2% of patients who died of poisoning were only hospitalized less than a day and 19.7% of patients were hospitalized for one to three days (table 2).

Table 2: Frequency distribution of hospitalization time of patients who died in the poisoning department of Razi Hospital

Duration of hospitalization	Number	Percent
Less than one day	179	54/3
3-1 days	65	19/7
7-4 days	42	12/7
More than 7 days	44	13/3
Total	330	100

The most common cause of death was related to opium consumption, followed by methadone consumption (table 3).

Table 3 - Frequency distribution of types of poisoning agents in deceased patients

Poisoning agent	Number	Percent
Opium	70	21/2
Methadone	56	17
Rice tablet (aluminum phosphide)	49	14/8
multiple drugs	31	9/4
Alcohol	29	8/8
Organophosphorus	16	4/8
Benzodiazepine	14	4/3
Corrosive substances	14	4/3
Acetaminophen	10	3
Tramadol	5	1/5
Etc.	36	10/9
Total	330	100

75.5% of patients who died of poisoning with rice tablet were women. In the case of poisoning with opium, 72.9% were men. In the case of poisoning with tramadol, 100% of deceased patients were men. Additionally, 100% of patients who died of poisoning with corrosive substances were women (Table 4).

Table 4 - Frequency distribution of poisoning agents in deceased patients by gender

Gender / Poisoning agent	Male		Female	
	Number	Percent	Number	Percent
Rice tablet (aluminum phosphide)	12	24/5	37	75/5
Benzodiazepine	7	50	7	50
Acetaminophen	10	100	0	0
Opium	51	72/9	19	27/1
Alcohol	28	96/6	1	3/4
Multiple drugs	15	48/4	16	51/6
Tramadol	5	100	0	0
Methadone	55	98/2	1	1/8
Organophosphorus	15	93/8	1	6/2
Corrosive	0	0	14	100

substances				
Etc.	28	77/8	8	22/2
Total	226	68/5	104	31/5

The most frequent complication in deceased patients was respiratory complications. Then, multiple organ complications were the most frequent complication among patients (Table 5).

Table 5: Frequency distribution of complications in patients who died in the poisoning department of Razi Hospital

Complications of poisoning	Number	Percent
Respiratory	109	33
Multiple organs	85	25/8
Cardiovascular	53	16/1
Cerebral	40	12/1
Renal	32	9/7
Hepatic	11	3/3
Total	330	100

DISCUSSION

Given the fact that in the last century, poisoning by drugs and toxic substances had a high prevalence due to the introduction of various formulas and chemical compounds in the market, and in most cases it leads to the death of patients, poisonings is one of the major problems facing the advanced society and medical world of today. It also is considered as an important issue for public health, which includes 15 to 20 percent of admissions to emergency rooms [3]. Additionally, drug poisoning is one of the largest and most severe type of poisoning, with the highest hospital admissions and the most frequent admissions to medical emergency services [7],[8].

In this study, 330 patients who died of poisoning and were admitted to the poisoning department of Razi Hospital in Rasht during the years 1390-1394 were examined.

Most of the subjects in this study were male (68.5%), while women comprised only 31.5% of the death cases by poisoning. The highest percentage of admitted patients who died of poisoning belonged to the age group of more than 70 years old (22.1%), followed by patients aged 30-40 years (18.2%), the age group of 20-30 years old (17.3%) and the age group of 40-50 years (13.3%).

The highest percentage of patients who died of poisoning had a high school diploma or less degree (43.3%). The highest percentage of patients died in the poisoning sector were unemployed (32.4%), followed by housewives with 26.7% and workers with 19.1% of the death cases. The highest percentage of deceased patients were married (80.3%). The highest percentage of patients who died of poisoning lived in Rasht city (59.4%) as well as other cities in Gilan province (40.6%).

44.8% of patients who died of poisoning were addicted to drugs. Among 148 patients with a history of underlying diseases, 130 people had experienced oral drug use (87.8%) and only 18 reported using inhaled drugs (12.2%).

95.5% of patients who died of poisoning committed suicide and the other 4.5% were unintentionally poisoned and died. 8.5% of the subjects had previously suicidal attempts. 30.6% of the patients died of poisoning in the poisoning section were poisoned in the autumn, 24.5% in the spring, 23.9% in the winter and 20.9% in the summer which led to their death. 54.2% of patients who died of poisoning were only hospitalized less than a day and 19.7% of patients were hospitalized for one to three days. The highest percentage of fatal poisoning method was oral consumption (89.7%), while the use of inhalable drugs comprised only 10%.

The most common cause of death was related to opium consumption (21.2%), followed by methadone consumption (17%) and then consumption of rice tablet (aluminum phosphide, 14.8%). The highest percentage of complications leading to the death of poisoned patients belonged to respiratory complications (33%), followed by multi organ complications (25.8%).

Afzali et al. conducted a research to determine the pattern of deaths due to drug and chemical poisoning in Hamadan during the years 1384-1386. Among 2920 patients admitted to hospitals because of poisoning, 111 of them (3.8%) died due to the complications cause by poisoning. The death rate in men compared to women was 5 t0 1. The mean age of the patients was 40.5 years and the highest death rates were observed between the ages of 21-30 years old. The intentional consumption of drugs was the most frequent case with 52.2%, and its proportion was twice in women that than of men (P = 0.001). Opium and its derivatives were the most common cause of death (45.9%). The most common complication leading to death was respiratory problems (56.7%). Based on the findings of this study, the researchers concluded that there is a high level of poisoning with drugs and chemicals and death by poisoning, especially poisoning with opioids and pesticides in Hamedan province. It seems that the increasing amount of poisoning with this type of substance is due to the ease of access to them [17].

In a study in 2004, Akkas et al. examined the epidemiology of deaths caused by poisoning among patients admitted to the emergency department. In this study, the average age of patients was 26 years, which was mostly women and students. The results of this study showed the percentage of poisoning the following substances: alcohol 11%, medicines (antidepressants) 32%, analgesics 20%, antibiotics 10%, benzodiazepines 9%, salicylates and cardiovascular medicines 7%; the mortality rate was less than 1% [18].

Dr. Fars Najari and Dr. Mahshid Afshar conducted a research to examine the poisoning cases leading to death in 1380 that had been admitted to medical jurisprudence. Based on the results obtained over the course of 12 months, 8800 cases were admitted to the autopsy department of

medical jurisprudence organization in which the cause of death was poisoning in 23.10% of cases. One sixth of these people were women and mostly single. The most common age was 21-30 years and the most common way of poisoning included intravenous injection and oral intake in the drug group and oral administration in the non-drug group. Intentional poisoning was observed in 60% of cases and accidental poisoning in 38% of cases. Regarding the cause of death, 10.7% was due to drug poisoning and 29.9% was non-drug non-medicine related in which heroin injection was the major cause in drug group. In non-drug group, the following were the major cases for women: poisoning by 3-ring anti-depressant (TCA), Inderal and carbon monoxide; the following were the major cases for men: poisoning by 3-ring anti-depressants (TCA), methanol, organophosphates, carbon monoxide and cyanide. Fourteen percent of all the patients were students [18].

CONCLUSION

The remarkable point in this study is that contrary to our expectations, the most frequent cause of poisonings which leads to death is not rice tablet, it is opioids with a significant percentage. Given that most death cases occurred in the first 24 hours, and on the other hand, it is possible to prevent the deaths by opioids to a large extent, it is necessary to consider therapeutic policies for developing facilities, timely diagnosis and providing proper and careful care in order to reduce mortality rates due to poisoning with these substances.

ETHICAL CONSIDERATION

Authenticity of the texts, honesty and fidelity has been observed.

AUTHOR CONTRIBUTIONS

Planning and writing of the manuscript was done solely by the author.

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CONFLICT OF INTEREST

No conflict of interest was reported by the author.

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REFERENCES

[1] Mintegi S, Fernández A, Alustiza J, Canduela V, Mongil I, Caubet I, Clerigué N, Herranz M, Crespo E, Fanjul JL, Fernández P. Emergency visits for childhood poisoning: a 2-year prospective multicenter survey in Spain. Pediatric emergency care. 2006 May 1; 22(5):334-8.

[2] Lamireau T, Llanas B, Kennedy A, Fayon M, Penouil F, Favarell-Garrigues JC, Demarquez JL. Epidemiology of poisoning in children: a 7-year survey in a paediatric emergency care unit. European journal of emergency medicine. 2002 Mar 1; 9(1):9-14.

[3] Van Der Hoek W, Konradsen F. Risk factors for acute pesticide poisoning in Sri Lanka. Tropical Medicine & International Health. 2005 Jun; 10(6):589-96.

[4] Hawton K. van HK. Suicide. Lancet. 2009 Apr 18; 373(9672):1372-81.

[5] Frank E, Dingle AD. Self-reported depression and suicide attempts among US women physicians. American Journal of Psychiatry. 1999 Dec 1; 156(12):1887-94.

[6] Gururaja G. Suicide prevention: emerging from darkness. WHO Regional office for south. East Asia. 2001.

[7] Murray CJ, Lopez AD. Global health statistics: a compendium of incidence, prevalence and mortality estimates for over 200 conditions. Harvard University Press; 1996.

[8] Kapur N, Turnbull P, Hawton K, Simkin S, Mackway-Jones K, Gunnell D. The hospital management of fatal self-poisoning in industrialized countries: An opportunity for suicide prevention? Suicide and life-threatening behavior. 2006 Jun 1; 36(3):302-12.

[9] Sabzghabaee AM, Eizadi-Mood N, Montazeri K, Yaraghi A, Golabi M. Fatality in paraquat poisoning. Singapore Med J. 2010 Jun 1; 51(6):496-500.

[10] Krenzelok EP. The use of poison prevention and education strategies to enhance the awareness of the poison information center and to prevent accidental pediatric poisonings. Journal of Toxicology: Clinical Toxicology. 1995 Jan 1; 33(6):663-7.

[11] Repetto MR. Epidemiology of poisoning due to pharmaceutical products, Poison Control Centre, Seville, Spain. European journal of epidemiology. 1997 Apr; 13(3):353-6.

[12] Institute of Medicine of the National Academies. Magnitude of the problem. In: Forging a Poison Prevention and Control System. The National Academies. 2004:43.

[13] Drug Poisoning in Iran [Online] 2008. [Cited2008 Dec 12]. Available from: URL: http://www.iranseda.ir/old/showfullitem/?r=153496.

[14] Akkose S, Fedakar R, Bulut M, Armagan E, Cebicci H. Acute poisoning in adults in the years 1996–2001 treated in the Uludag University Hospital, Marmara Region, Turkey. Clinical toxicology. 2005 Jan 1; 43(2):105-9.

[15] Akkas M, Coskun F, Ulu N, Sivri B. An epidemiological evaluation of 1098 acute poisoning cases from Turkey. Veterinary and human toxicology. 2004 Aug 1; 46(4):213-5.

[16] Moghadamnia AA, Abdallahi M. Anepideromological study of poisoning in north of Islamic Republic of Iran: East Mediterr Health J 2002; 8(1): 88-94.

[17] Afzali S, Kashani Khosrow M, Abbasi KF. Determination of the pattern of deaths

due to chemical and toxic poisoning in Hamedan during the years 2005 to 2007.2(2):27-31.

[18] Najari F, Afshar M. A report of fatal poisoning cases admitted to the country's medical jurisprudence in 2006. Razi Medical Journal. 2006; 3(2):6-19.

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