RESEARCH ARTICLE

Investigating the Cause of Mortality in Patients Admitted to Poisoning ICU within the Last Six Years

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ABSTRACT

Poisoning is one of the social dilemmas that investigating and paying attention to the factors involved in causing poisoning and effective factors in the treatment process is very essential. This research is an epidemiological descriptive-analytic study and based on the information of patients, referring to the poisoning ICU of Ahwaz Razi Hospital during 2013 to 2018. The average age of poisoned people was 38.16± 17.61 and 71% of them were men and other was women. The people between 26 to 50 years of old were generally poisoned by medicine (41%) and Opium (35%) but between the age of 0-25 (82%) and 51-75 (50%) the most important factor of poisoning was poison and in the age of above 75 years old (100%), the most important factor of poisoning was medicine. Both in men (35.16%) and women (66%) the most important factor of poisoning was poison. 63.04% of men and 42.85% of women were admitted to the hospital for 1-5 days. The most important factor of admission was loss of consciousness and after that there were factors like digestive symptoms, respiratory problems, and kidney problems.

INTRODUCTION

Intensive care refers to all sensitive cares which are dependent on patient's life. More precisely we can say that intensive care is caring for patients with acute and life-threatening illnesses, under the supervision of the most skilled personnel via advanced equipment. ICU department is a place in which these kinds of patients are supervised. Today, the form of intensive care unit is not like the general ICU form and has become as dedicated units to care for patients with a common disorder.

Indications for admission to the ICU are: patients requiring respiratory support, patients who need the support of an organ or some organs of the body, patients with chronic disorder of one or more organs who are not able to do their daily activities, patients who need the support of reversible organs' failure, patients who do not require ICU for a long time, patients who benefit from intensive care. In order to understand the factors that increase mortality in ICU patients, many studies have been done. Factors that increase the mortality rate in the ICU are: patients admitted to the ICU who are dependent on the ventilator for more than 14 days, the age over 65 years old, infectious shock, patients with cardiac-kidney disease and hospital infections. The

time of admission to ICU is also important. The time of admission after 5 pm is accompanied with higher mortality. Patients admitted in the evening shift (5 pm to 7 am) are often faced with more side-effects problems. In a vast research which was done in more than 28 hospitals with 37 intensive care units, it was shown that age increasing is singly a very important factor in the increase of mortality and for every 5 years of age increase, mortality increases as well. Intentional and unintentional poisonings and the rate of morbidity and after that mortality are consistently of the most significant factors of the imposition of financial charges on the health system of any society. Still, the mortality rate caused by poisoning is estimated 0.5% overall; while, this number arrives up to 2% in admitted patients. It is estimated that in Iran the death rate caused by poisoning is 8 people per 1000 admitted people in hospital units and 209 people per 1000 admitted people in intensive care units. Poisoning is the most common cause of admission at hospital and the second cause of death for admitted patients in Iran.

In a two-year study which was done in the intensive care unit of Loqman hospital by Dr. Pazhoumand and Dr. Jalali, the most important factor of mortality among 16759 persons, referring because of poisoning,

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(with mortality rate of 97%) were respectively: poisoning with opium compounds (47%), medicines, vegetable toxins, cleaning drugs, rice pill, alcohol, rodenticides, gas poisoning, poisonous plants and hydrocarbons, bites, and miscellaneous factors. The mortality rate in men was 71% and in women 29% and most statistics was related to ages over 50 years old. About 95% of poisonings were occurred with intentional impulse, 4% accidental, and in other cases it was pursuant to criminal matters or claiming to crime and also war poisonings. Among medicines the most common factors of poisoning were the benzodiazepine compounds (30%), TCA (15-20%), and then psychotropic drugs and heart medications (01). The purpose of this study is investigating the cause of mortality of admitted patients at the poisoning ICU within the last six years. This research may help doctors to review the cause of mortality of poisonous patients admitted at the poisoning ICU.

MATERIALS AND METHODS

This research is an epidemiological descriptive-analytic study and based on hospital information, which is gathered within six years (2013 to 2018) and through studying the case of all patients referring to the poisoning ICU of Ahwaz Razi Hospital.

The followings were investigated: demographic characteristics of poisoned person, poisoning factor, type of consumed material or bite, side-effects, time of admission, using ventilator, using antidote, loss of consciousness, surgical measures, need for dialysis, and the rate of mortality in patients. Patients, whose medical records information was incomplete, were excluded. Data were reviewed using statistical software SPSS23 and chi square statistic test, and considering the statistical as P-value less than 0.05, the relationship between the variables in the significance study were examined (02).

RESULTS

Total no 129 patients, 91 poisoned persons were men (71%) and 38 poisoned persons were women (28%), and the average age in poisoned people was 38.16±17.61. 40 percent of the people to be studied were in the age group of 26-50. In other categories, there were 42 persons (32%) in the age group of 0-25, in the age group of 51-75 there were 30 persons (23%), and in the age group of 75-100 there were 5 persons (4%). Loss of consciousness with 42.85 percent in men and 52.63 percent in women was the most important factor of admission and after that the most frequent factor of admission of patients were digestive symptoms,

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respiratory problems, and kidney problems. 76 persons, 48 men (89%) and 5 women (11%), had underlying disease, and 63.f04 percent of men and 42.85 of women were admitted for 1 to 5 days (Table 1).

122 persons from 129 people to be studied needed ventilator and 59 poisoned people used antidote that 48 persons were men (81%) and 11 persons were women (19%). Women used more antidote compared with men. Patients needed dialysis in all age groups.

However, many people 108 persons- needed antibiotic. Also, among people with surgery, the most common type of surgery was CV line surgery. In all groups with different admission duration, addiction was the most important underlying disease. Refer Table 1 for Categories of people based on admission time and underlying disease.

The highest level of poisoning, among women 24 persons and among men 34 persons, was poisoning with agricultural pesticides and all people who were poisoned with alcohol and bites were men (table 2). Most of people with poisoning were in the age group of 26-50 that in this group poisoning with medicine had the highest frequency. In other age groups, poisoning with poison was the most common factor of poisoning. Refer Table 2 for Categories of people based on sexuality and type of poisoning.

People of the age group of 26-50 formed the largest age range. From a total of 129 people, 118 people did not need brain CT scan, and 11 people needed the so that most of them belonged to the age group of 26-50.

In all age groups to be studied, only 15 people needed neurology consultation that most of them belonged to the age groups of 26-50 and 51-75. None of the neurology consultation.

24 patients in the age group of 0-25 needed admitted people were dialyzed. All people who were dialyzed were admitted less than 15 days. From 129 people, 124 persons did not need doing tracheostomy and only 5 persons needed the so that they were admitted for 16 to 20 days.

In two age groups of 26-50 and 51-75, most of poisoned people did not need surgery and for people with more that 10-day admission, the surgery was done.

In all age groups, CV line was preferred compared with laparotomy. 50 percent of CV lines were less than 25 years old. Also, 57 people (35 men (62.5%) and 21 women (37.5%)) used the surgical measures the significant relationships among the studied

parameters are in shown. refer Table 3: Examining the relationship among variables

The current study, the mean of the poisoned patients' age was 38.16 ± 17.61 years, 40% out of 128 subjects were aged between 26 and 50 years old, 57% of whom were hospitalized between 1 to 5 days. 71% of the poisoned were men (mean age 39.08 ± 18.86 years) and 28% were women (mean age 35.81 ± 13.88 years). In the study of (Masoumi 2013) on intentional and unintentional poisoning in patients referring to the hospital, it was reported that the age group of 19-24 years old had the highest rate of poisoning, which is in line with the findings of present research in terms of the mean of age and its distribution.

According to the findings of this study, there was a significant relationship between age and type of poisoning, and people aged 26 to 50 were generally poisoned with medicine (41%) and opium (35%), but among 82% of the poisoned at the age of 0-25 and 50% at the age of 51-75, a toxicant substance was the most significant factor of being poisoned. However, over the age of 75, 100% of poisoning was caused by drug. In the study of (Rostamian 2015) on the relationship between acute drug toxicity and age in Baharlo hospital in Tehran, a

significant relationship was found between age and type of drug, and the use of antidepressant and sedative drugs was higher among the older ages (3) which is consistent with the findings of present research. There was a relationship between gender and type of poisoning. In women, poisoning was more limited and included drugs, opium and toxins. While in men, in addition to the above cases, alcohol, snakebite and scorpion envenomation were among the causes of poisoning. In men (35.16%) and in women (66%), toxins were the main cause of poisoning. Among women, drug (27.77%) was in the second place and opium (5.55%) in the third place; while among men the opium was in the second place and drug was in the third place. In a study on the cause of hospitalization of pregnant women by Shayesteh. 2017, it was found that drug was the cause of poisoning in 85.5%, and toxins were at the end of the list by 3%. Also, easy access, delivery of over-the-counter drugs and the maintenance of the extra drugs in the home were among the highly contributing factors of this type of poisoning, especially in women. Men's easier access to drugs can be a cause of higher drug. Toxicity among men, which is similarly reported in the study of

Moghadamnia (1999) about suicide-induced poisoning in Mazandaran (04).

In a study by Farzaneh. (2012) on poisoned people who were admitted to Imam Khomeini Hospital in Ardabil, poisoning with toxins was ranked first and drug poisoning was ranked second. In a study by Karami. (2004) in Bouali and Sha'ban hospitals in Sari, they reported that women were more likely to be poisoned than men and among the factors causing poisoning, medication with 50.8% was in the first rank and non-medication factors such as opium and derivatives with 89.1% and chemicals with 10.9% were in the next ranks, which is contrary to the findings of the present study. (Bushehri 2004) surveyed the prevalence of consuming chemical and pharmaceutical materials in poisoned patients in Taleghani Hospital of Urumieh, and found that medication with 65.9% were the most important cause of poisoning and toxins with 23.3% ranked second, and opioid materials with 5.4% ranked third (05).

In men, addiction and cigarette smoking were significantly more than women, and this was the cause of the disease in men and the most important cause of poisoning. Maleknejad. (2012), in a study of the epidemiology of deaths caused by poisoning which were referred to Mashhad forensic organization, reported that the use of narcotics is the most important cause of poisoning and death among men, (92%). (06), which is consistent with the findings of this research.

According to the results, there was a significant relationship between sex and duration of hospitalization, and there was no significant relationship between age and duration of hospitalization, and the cause of poisoning and the duration of hospitalization. This means that 63.04% of men and 42.85% of women were hospitalized for 1-5 days, however women were staying in the hospital more than 20 days. In the study by (Bushehri 2004), the frequency of using chemical and pharmaceutical materials in poisoned patients admitted to Taleghani Hospital in Urumia, it was reported that 80% of patients were hospitalized between 1-3 days, of which 70% had drug toxicity (06). In their research, poisoning with pesticides had the highest number of admission days and lasted more than 7 days in 53.6% of cases, while in the present study, 64% of people poisoned with toxins were hospitalized for one to five days (there was a correlation between the duration of hospitalization and the causes of hospitalization), which is contrary to the findings of (Bushehri 2004). In a study by

(Yaylac 2018) that examined poisoning in Turkey and the care measures, the average days of admission was 2.4 ± 1.6 days (07), which was less than the 6.79 ± 9.16 days found in the present study.

The percentage of men who used antidote was significantly higher than that of women, which may be due to higher use of narcotics by men, which, unlike drugs, has more antidotes. However, 54% of the subjects did not use antidote, since they were caused by toxins. In a study by (Moghadamnia 1999), the administration of antidotes, especially selective antidotes, is sometimes very effective and life-saving, but unfortunately, all the poisons do not have an antidote, and those who have are not all specific, or the medical staffs are poorly acquainted with them (08), which may explain the lack of using antidotes in most patients. Therefore, encouraging and introducing the antidotes to the medical centers staff and supplying and application of them can be helpful in improvement process.

By increase of age, the need for using the ventilator reduced, and all patients in the age range of 0-25 years old used a ventilator. In fact, there was a significant relationship between age and the use of ventilator. In the study of (Strom 1986), drugs were introduced as the main cause of poisoning,

and respiratory protection was the main treatment method, and all the patients were connected to a ventilator, which is close to the 93.99% found in the present study. Of course, 3.45% of patients needed dialysis. The results of the present study showed that the need for dialysis increased significantly with age, and 19.67% needed dialysis, which can be justified due to the level of toxicity, health, age, gender and other factors.

Moreover, reduced level of consciousness was the most important factor in hospitalization and after that, gastrointestinal symptoms, respiratory problems and renal problems were the main factors, which also showed a significant relationship with age. In the study of (Mahdizadeh 2015), the frequency and causes of poisoning in patients who referred to Shahid Beheshti Hospital in Babol was examined. This study indicated that cardiovascular complications with 50%, ocular complications with 33.3% and neurological complications with 33.3% were the most prevalent complications (19) which is contrary to the findings of the present research.

In a study by (Behnoosh 2006) on the prevalence, mortality, and complications of non barbituratine anticonvulsant drug

overdose on patients of Loghman Hospital, it was found that decreased consciousness (56%) was the most important complication and respiratory disorders and urinary tract infections were in the next ranks, which is in line with the findings of the present research, but contrary to the findings of (Afzali 2008), who identified respiratory problems (56.7%) as the most common complication.

Brain CT Scan and neurologic counseling were required in all age ranges except among the 0-25 years. In a study by (Yaylac 2018) on poisoning in Turkey, it was found that 88.2% of the poisoning was caused by drug overdose, and all people needed a neurological consultation (9), while in the present study, only 11.62% of patients needed neurologic advice.

The results showed that there was a significant relationship between surgical procedures and hospitalization duration, based on which only people with duration of admission of 1-5 and 6-10 days required surgery.

On the other hand, the data showed that there was a significant relationship between the age and the referral district. At the age of 0-25 and 75- 100 years old most patients were from small cities and in other groups the direct referral to the emergency department was the main factor. This may be due to the need for special care for this group, which unfortunately is available in fewer cities and towns, so it is necessary to have sufficient trained cadres in all cities.

On the other hand, in this research, the intentional or unintentional aspect of poisoning has not been addressed, which should be considered in future studies. Also, given that poisonings are influenced by culture, access, and the environmental factors (10), it is necessary to consider the factors involved in the context of culture and social conditions.

REFERENCES

1. Marchi AG, Messi G, Reniers S, 1992. Epidemiology of children poisoning: comparison between telephone inquiries and emergency room visits. Vet Hum Toxicol; 34(5):402-404.

2. Sobhani AR, Shojaii Tehrani H, Nikpour E, Noroozi Rad N, 2000. Drug and chemical poisoning in Northern Iran. Archives of Iranian Medicine; 3(2): 32-36.

3. Haddad Lester M, 1998. Management of clinical poisoning and drug overdose. Third edition,

USA, W. B. Saunders Company; page 57-62.

4. Maleknejad M, Hejazi A, Gonadbadi Gh. 2012. Epidemiological study of death due to poisoning referred to Mashhad forensic organization in 2012.

5. Yaylacı S, Genç AB, Demir MV, Cinemre H, Tamer A, 2016. Retrospective evaluation of patients at follow up with acute poisoning in Intensive Care Unit. Nigerian journal of clinical practice. 19 (2) 223-6.

6. Strøm J, Thisted B, Krantz T, Bredgaard Sørensen M, 1986. Self-poisoning treated in an ICU: drug pattern, acute mortality and short-term survival. ActaAnaesthesiol Scand.; 30 (2):148-53.

7. Mahdizadeh Gh, Manouchehri AA, Zarghami A, Moghadamnia AA, 2015. Prevalence and Causes of Poisoning in Patients Admitted to Shahid Beheshti Hospital of Babol in 2011-2012. J Babol Univ Med Sci.17 (7):22-8.

8. Behnoosh B, Pajumand, A, Tagahadosinejad F, Delirrad M. 2006. Prevalence, mortality and complications of Non-Barbiturattic Anticonvulsant Poisoning in Loghman Hospital, Journal of Tehran University of Medical Sciences. Volume 64. Issue 1. pp. 80-84.

9. Afzali S, Kashani Kh M, Abbasi Kolsum F, 2008. Determining the pattern of deaths caused by chemical and toxic poisoning in Hamedan. Journal of Qom University of Medical Sciences, Issue 2, pp. 27-32

10. Masoumi G, Eizadi-Mood N, Akabri M, Sohrabi A, Khalili Y, 2012. Pattern of Poisoning in Isfahan. J Isfahan Med Sch. (29)163.

Table 1: Categories of people based on admission time and underlying disease

Underlying disease						admission time (day)
No underlying disease	Other underlying diseases	blood pressure	Heart disease	addiction	Diabetes mellitus	
43	4	0	4	18	4	1-5
17	6	2	3	4	0	6-10
10	0	0	0	3	1	11-15
2	1	0	0	3	0	16-20
2	0	0	0	0	0	>20
76	11	2	7	28	5	total

Table - 2 Categories of people based on sexuality and type of poisoning

Type of poisoning							
Others	Poison	Scorpion bite	Snake-bite	opium	alcohol	medicine	Sexuality
2	34	1	1	26	6	23	Men
0	24	0	0	2	0	10	Women
2	58	1	1	28	6	33	total

Table – 3 examining the relationship among variables

relationship	Significance level	Variables	
No significant relationship	0.69	Using antibiotic	age
	0.33	Using ventilator	
	20.84	Referral area	
significant relationship	0.03	Doing dialysis	
	0.001	Causes lead to admission	
	0.001	Using ventilator	
	0.02	Brain CT Scan	
	0.001	Doing neurology	
	0.05	Surgical measure	
	0.05	Type of surgery	
	0.001	Type of poisoning	
No significant relationship	0.06	Using antidote	Admission time
	0.07	Using antibiotic	
	0.09	Type of surgery	
significant relationship	0.001	Surgical measure	
	0.04	Causes lead to admission	
	0.001	doing tracheostomy	
	0.04	Doing dialysis	
No significant relationship	0.06	Doing dialysis	sexuality
	0.07	Type of surgery	
	0.06	Using ventilator	
	0.06	Using antibiotic	
	0.26	Causes lead to admission	
significant relationship	0.03	Using antidote	
	0.001	Underlying disease	
	0.05	Admission time	
	0.01	Type of poisoning	