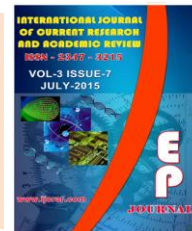




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Evaluation of acute pulmonary complications in patients with drug poisoning admitted to the emergency Department of Sina hospital

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A B S T R A C T

In adults, the most common form of poisoning is voluntary and intentional intoxication. Drug poisoning is included about 20-15 percent of visits to the emergency room. The aim of this study was determine the acute pulmonary complications in patients with drug poisoning admitted to the emergency department of Sina hospital. In a descriptive and analytical study that performed in Emergency Department of Tabriz University of Medical Sciences of patients with drug poisoning, the acute pulmonary complications in patients with drug poisoning admitted to the emergency department of Sina hospital evaluated. Of all cases referred to the emergency department with the poisoning in one year were 3139 cases, which 939 of these patients were admitted and just 61 patients of them had pulmonary complications. 43 of patients were male and 18 of them were female. Mean age of male patients was 44.79 ± 17.37 year and in female patients was 27.50 ± 11.49 year ($P=0.001$). In 35 patients (57.4%) of patients, drug history was positive. In 13(21.3%) of patients, history of hospitalization due to drug poisoning was positive that in 8 patients with second drug poisoning and in 5 patients with several time of drug poisoning. Mean time of pulmonary complications outbreak in male patients was 3.69 ± 2.37 day and in female patients was 3.66 ± 4.11 day ($P=0.971$). 47(78.7%) of patients were intubated and underwent mechanical ventilation. Of 48 patients, 33 patients in emergency ward and 15 patients in ICU or General ward underwent intubation. Mean duration of hospital stay in male patients was 11.18 ± 12.04 day and in female patients was 10.77 ± 10.16 day ($P=0.900$). 46(75.4%) of patients were alive and 15(24.6%) of them were dead, that of these 46 patients, 9 patients discharged and 32 patients' referred to Razi Hospital and 5 patients discharged with personal satisfaction. In our study, almost pulmonary complications in patients drug poisoning included pneumonia and especially was aspiration pneumonia, which is expected to consider the clinical condition. The two main risk factors in these patients, including loss of consciousness, intubation, and subsequently there is a connection to the ventilation that is common areas of the condition of the patients.

Introduction

Medicines are chemical substances used for the diagnosis, treatment or prevention of diseases (1). Today, one of the important medical challenges is selection of proper drugs because any drug may have side effects due to the simultaneous use of several drugs or complications that change the pharmacokinetics and pharmacodynamics of drugs (2). However, with the scientific advancements, medicines with fewer side effects have been produced (3).

A medicine is any small molecule that changes the function of body after entering into the body by inducing molecular reactions. Toxins are drugs or chemical substances that enter the body either for criminal and suicide purposes or accidentally. Toxication is the result of presence of a high concentration of a drug or toxin in the body. A toxin is any natural, synthetic and medicinal compound that can cause damage, disturb the natural function of an organism, or even lead to death (1).

Most of the mortalities are caused by deliberate use of a high dosage of a medicine or toxin for the purpose of suicide. In other words, the most common form of poisoning in adults is deliberate poisoning. Due to the color diversity of medicine packs and the attraction, shape, color and appearance of medicines children are mostly exposed to the risk of non-deliberate intoxication with medicines. Statistics suggest that the rate of child mortality caused by accidental use of a medicine or a simple domestic substance has decreased in the last 30 years due to the application of safety measures to the packs and effective training on prevention of poisoning. However, major depression, spread of social anomalies, tendency for tipsiness and escaping social realities or forgetting personality flaws are among the significant

factors leading to deliberate toxication of adults (1).

Medicinal poisoning which accounts for 15 to 20% of visits to the emergency wards reveals the use of a high dosage of a medicine (more than the prescribed or recommended dosage). It is one of the most common and horrible forms of toxication that results from a wide range of causes such as excessive use of prescribed drugs and medicinal complications (2, 4). In Iran, due to the plentitude and availability of medicines and toxic medicines (such as vegetative and animal poisons) and drug abuse or drug addiction both the accidental and deliberate toxication are common (3). In Turkey, accidental or deliberate poisoning has turned into one of the problems of emergency care centers of the country (4). However, some countries use preventive plans and measures to minimize the outcomes of poisoning. For instance, France has developed preventive plans since 1983 and has reduced the mortality and expenses caused by poisoning to 50% (4).

Drug toxicity has several potential side effects. For example, Shanti et al. pointed out that cocaine damages body organs by inducing intense vasoconstriction (5). However, this article discusses the pulmonary side complications caused by drug toxicity. For example, Christopher et al. indicated that inhale of the smoke of weed, which is combined with other substances such as formaldehyde and phencyclidine (or both) leads to pulmonary complications. They reported the case of two patients who experienced pulmonary failure as a result of inhaling weed smoke. Both of the aforementioned patients needed a period of outer-membrane oxygenation and after a long-term hospitalization both patients were released only with slight pulmonary dysfunction (6).

Elhadi et al. reported a chronic pulmonary inflammation caused by the consumption of cannabinoids and stated that these materials are considered a new toxicological hazard (7). In addition, in a study by Drent et al. it was found out that besides environmental factors, drugs are also among the common causes of interstitial lung diseases whereas it is often hard to find the relationship between consumption of drugs and advancement of relevant inflammatory damages (8).

Camus et al. carried out a survey study in which they put emphasis on drug-induced infiltrative lung diseases (9). In the research by Michelle et al. on patients consuming Amiodarone, 8 patients showed pulmonary side effects of Amiodarone and one patient died (10). Peters et al. also reported a case of major alveolar bleeding after the intake of amphetamine (11). Jay found a significant relationship between drug abuse and lung emphysema (12). Considering the significance of the issue and the shortage of information on the epidemiology of patients with toxicity-induced pulmonary complications as well as the type of toxicity and the resulting pulmonary complications in Iran it was decided to conduct a study on this issue. The objective of this study was to determine the acute pulmonary complications demonstrated by patients with drug poisoning who visited the emergency ward of Sina Hospital.

Materials and Methods

In a descriptive-analytical study that was carried out in Tabriz on patients with drug poisoning, the acute pulmonary complications shown by patients with drug poisoning, who visited the emergency ward of Sina Hospital, were investigated.

In this research, all of the patients who visited the emergency ward of Sina Hospital

from 2013 to 2014 with complaints about the acute pulmonary complications caused by drug poisoning were studied. It is worth mentioning that in order to examine the pulmonary complications faced by patients they were asked to describe their situation. To perform physical examinations of the lungs the CXR and CT-Scan (if needed) methods were employed.

Patients with a history of severe pulmonary diseases such as lung cancer, advanced chronic obstructive pulmonary disease, cardiac failure, multiple drug intoxication, chronic drug use (with unspecific drug types), and intoxication accompanied by severe trauma were excluded from the study as confounding factors due to the possibility of emergence of bias.

Ethical Considerations

In this study, the patients' information remained confidential and the questionnaires used to collect data were submitted anonymously. The research objectives were completely explained to the patients or their companions and after completing the informed consent form the patients were included in the study.

The information obtained from the research is only used for research purposes and all of the patients' information will remain confidential. This proposal was at the same time submitted to the Research Center for Tuberculosis and Lung Diseases as a research proposal.

Statistical Analysis

The collected data were analyzed by SPSS-17 statistical software. The collected data were expressed as percentage and mean \pm SD. Continuous (quantitative) variables were compared by Independent samples and

Paired t test. Categorical (qualitative) variables were compared by contingency tables and Chi-square test or Fisher's exact test. P-value ≤ 0.05 was considered statistically significant.

Result and Discussion

All of the cases who visited the emergency ward with poisoning complaints were 3139 cases in the year. Of this number, 939 patients were hospitalized and only the 61 patients who experienced pulmonary complications were selected for the study and the following results were obtained.

43 patients were male and 18 were female. The average age of male patients was 44.79 ± 18.37 years and the average age of female patients was 27.50 ± 11.49 years ($p=0.001$). Concerning the main complaint of the patients at the time of visiting the center it can be said that 51 complained about declined consciousness and 7 complained about vertigo. Moreover, one patient complained about seizure, one complained about drowsiness and one complained about apnea.

In 37 patients (60.7%) the history of previous cardiac diseases was positive. Concerning the previous diseases in patients it can be said that 18, 7, 5, 3, 2, 2, 2 patients were suffering from depression, bipolar disorder, hypertension, diabetes, hypothyroidism, mental retardation, and asthma, respectively. Anemia, Alzheimer, MS, psychosis, IHD, and PTE were each seen in one patient.

In 23 patients (37.7%) the history of previous hospitalization was positive. Of this group, 13 were admitted because of intoxication, 4 were admitted in the Razi Hospital for psychological illnesses, 3 were admitted due to trauma, and 3 were admitted because of C-section. Moreover, skull

surgery, prostate surgery, cholecystectomy, MS, cataract surgery, and PTE each were the cause hospitalization of one patient.

In 35 patients (57.4%) the history of drug abuse was positive. In 13 patients (21.3%) there was a history of hospitalization because of drug intoxication. Of the 13 patients, 8 were experiencing their second drug poisoning and 5 experienced several drug intoxication. In 29 (47.5%) there was a history of psychological disorders. Of the 29 patients, 8 (13.1%) had a history of psychological disorders in their families.

The drugs used by patients under study are presented in chart 1. The average interval between drug intake and visiting the emergency ward was 5.68 ± 7.43 hours and 3.11 ± 5.55 hours in men and women, respectively ($p=0.218$). The pulmonary complications in the patients under study are shown in chart 2.

The average time required for the development of pulmonary complications in the male and female patients was 3.69 ± 2.37 days and 3.66 ± 4.11 days, respectively ($p=0.971$). 32 patients (52.5%) were admitted in the ward and 29 (47.5%) patients were admitted in the ICU.

48 patients (78.7%) were intubated and were exposed to mechanical ventilation. Of the 48 patients, 33 were intubated in the emergency ward and 15 were intubated in the ward or ICU. The average duration of hospitalization of male and female patients was 11.18 ± 12.04 days and 10.77 ± 10.16 days, respectively ($p=0.900$).

46 patients (75.4%) survived and 15 (24.6%) died. Of the 46 patients who survived, 9 were discharged from hospital, 32 were sent to Razi Hospital and 5 left the hospital with their personal consent.

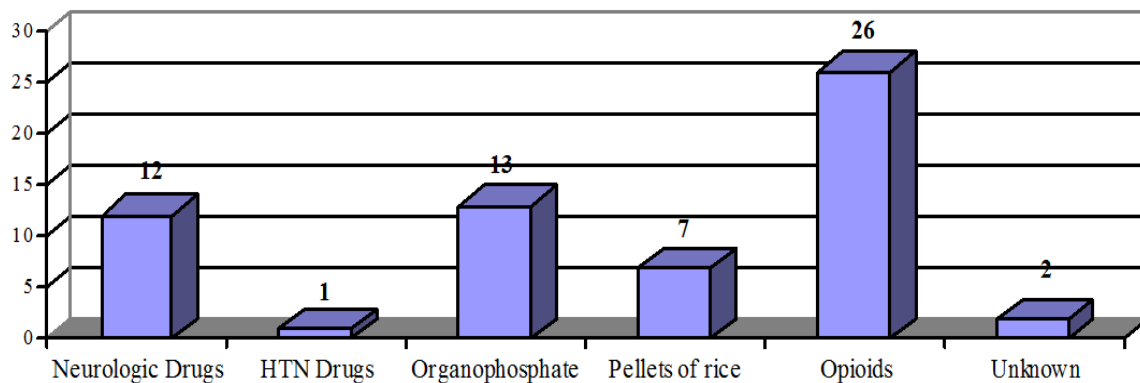


Chart.1 Drugs used in patients

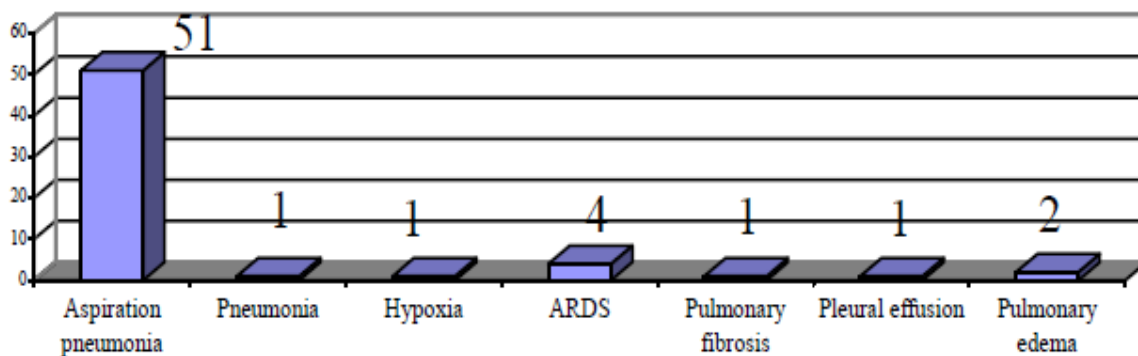


Chart.2 The frequency of pulmonary complications in patients

The ECG of 47 patients was normal and that of 14 was abnormal. Sinus tachycardia, increased ST segment in anterior leads, and reversed T wave were observed in 11, 1, 1, and 1 patient, respectively.

Concerning the chest X-ray images of the patients, 12 had normal images and 37 had abnormal images. Moreover, 12 patients either lacked chest images or the documents were missing from their files.

In recent years, due to the development and growth of societies and ease of access to drugs and toxins, the prevalence of poisoning has increased drastically. Today, intoxications are of the important causes of visiting hospitals. Considering global

statistics, poisoning is the most important cause of acute diseases in many developed countries of the world (13).

In the United States, about 5 million people visit hospitals because of drug poisoning (14). Moreover, according to the results of previous studies, the prevalence of intoxication is also high in Iran (15) and unfortunately a large part of the intoxications are deliberate and are meant for suicide (15). Medicines and toxins are also the largest cause of deliberate intoxications (16). In addition, the ease of access to medicines and toxins also paves the way for the use of the aforementioned substances for suicide (16).

Suicide is a major issue in the society and accounts for 9% of all mortalities (17). Suicide is the eighth cause of mortality in the United States (18) and it is anticipated that by 2020 suicide will be among the top 10 causes of death in the world (17). The rate of suicide among men in England, Wels, Scotland and Ireland has increased since 1975 whereas the number of deaths caused in women by suicide has declined (19).

In Greece, the prevalence of suicide in men was higher in all age groups as compared to women from 1980 to 1995 and the reasons for suicide were very complicated (20).

In our study, 43 of the patients were male and 18 were female. Suicide occurs due to different reasons in different age groups. For example, in the youth suicide is mainly the cause of social issues, parent-child relationship, academic failures/problems, social failures, puberty-induced physical changes, loneliness, and issues resulted from expression of identity and personality crisis. Reasons such as crowded families, addiction of parents, family collapse and a tendency for the abuse of drugs and alcohol are among the other causes of suicide (21-22).

Seemingly, the age of puberty is one of the most important causes of the tendency for suicide in some certain social and psychological conditions. The frequency of suicide attempts at this age has been investigated by various studies (19,23).

In Iran, the lower rate of suicide among the elderly as compared to the western countries can be explained by the existence of family bonds and the respect shown to the elderly (3) because of Iranian culture and customs. In addition to the aforementioned points, the high prevalence of drug suicide can be explained by the availability of OTC

medicines and inaccurate prescriptions that lead to excessive use of medicines (17, 24). Drug poisoning (either deliberate or accidental) was mostly caused by psychiatric drugs especially anti-depressants. This finding complied with the results reported by similar studies in Sweden (17). In our study, 12 (19.7%), 8 (13.1%), and 12 (19.7%) patients experienced drug poisoning by psychiatric drugs, opium, and organophosphate toxins, respectively.

The high percentage of intoxication by opioids was caused by the abuse of opioid pain killers that were used for the treatment of pains or for reaching a state of tipsiness (25).

Intoxication was the most common cause of suicide among Greek women (18%) whereas only 9.4% of suicides by men were caused by poisoning (23).

According to a study that was carried out in Iran, 93.4% of suicides among children are caused by drug use and 3.3% are caused by non-medicinal methods (such as hanging). In this regard, 30% of the drugs were tricyclic antidepressants and 20% were anti-seizure drugs (25). Based on the results of a study in Sweden, more than 25% of suicide attempts are made by people over 65 years old (26). Unlike the above study, in our study only 27.9% of intoxications were experienced by people over 50 years old.

Drug intoxication is a common way of suicide in Sweden. In this country, the youth usually commit suicide using non-prescribed drugs (usually Acetaminophen) and the elderly use prescribed medicines. About 33% of the intoxications are caused by benzodiazepines and antidepressants (17). Findings of some studies revealed that benzodiazepines are the most common types of medicines used for suicide (17, 26-27).

In our study, psychiatric drugs (including benzodiazepines) were the most common drugs used for suicide. In Poland, the prevalence of poisoning with sedatives and psychiatric drugs among adults is 83.7% (26). According to this report, second to psychiatric drugs, the simultaneous use of several drugs was the second most common cause of suicide poisoning (28).

Unfortunately, the prevalence of suicide in the adolescents is higher than other age groups (29-31). In our research, the highest percentage of patients with poisoning (44.3%) was in the 14-30 years age group. The studies by Van-der-Hock (32), Kotwica (33), and GnyP (34) also indicated that the number of men who use medicines and chemical substances to commit suicide is larger than women. In a study in Denmark in 1992 it was concluded that severe intoxications with barbiturates, Acetaminophen, and benzodiazepines were higher in women than men (34). Results of a 1998 study in New Zealand also showed that the number women who use acetaminophen (Paracetamol) and antidepressants for self-poisoning is larger than men (35).

In addition, the relationship between gender and type of poisoning was also confirmed in Europe by Bill Brahe (36). Undoubtedly, gender is a determining factor for the type of the substance used for suicide. This can perhaps be caused by the fact that people deal with medicinal or toxic factors depending on their gender. For instance, men may be more in contact with chemical substances than women because of their gender.

Conclusion

In our study, the common pulmonary complications were pneumonia-related and the most common complication was

aspiration pneumonia. Considering the clinical conditions of patients it is anticipated that there are two major risk factors in such patients, namely the loss of consciousness and intubation (and the consequent attachment to a ventilation device), which cause the prevalence of the complications in such patients.

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