Original Article
Toxicology International, *May-Aug 2016 / Vol-23 / Issue-2, 140-146*
ISSN (Print) : 0971-6580
ISSN (Online) : 0976-5131
DOI: 10.22506/ti/2016/v23/i2/146689

Pattern of Acute Adult poisoning In Gorgan, North of Iran

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Abstract

Acute poisoning is a serious global problem. The aim of this study was to identify the trends and characteristics of acute poisoning in Gorgan, North of Iran. The study was carried out retrospectively on acute adult poisoning cases who were hospitalized in 5th Azar Hospital of Gorgan, from March 2008 to March 2015. Data were obtained from patient records in a preset checklist. Stata software (version 11) was used for data analysis. Of 800 patients, 55.88% were men and 44% were aged 20–29 years. The majority of patients (75.38%) lived in urban areas. Poisoning occurred mostly in summer and the peak was observed in Aug. Most of the poisoning agents were pharmaceuticals (71.62%). Among the pharmaceutical agents, benzodiazepines were involved most often. Overall, 38 patients (4.75%) died. The highest number of deaths was due to aluminum phosphide poisoning (42.10%). Intentional poisoning were identified as the main kind of poisoning, In addition, family quarrel was the main cause of intentional poisoning (31.60%).There were significant differences between poisoning and demographics characteristics including gender (P= 0.001), age group (P<0.001), marital status (P<0.001), employment status (P<0.001) and educational status (P<0.001). Intentional poisoning by pharmaceutical agents were identified as the main cause of poisoning. Finally, people with these characteristics should be targeted prevention and educational programs against intentional poisoning.

Keywords: Intention, Suicide, Poisoning, Adult, Iran

Received: 13-02-2016 **Revised:** 05-07-2016 **Accepted:** 31-07-2016

1. Introduction

Poison is a substance capable of producing damage or dysfunction in the body by its chemical activity. It can enter the body through various ways and produce general or local effects. Poisoning is a qualitative term used to define the potential of a chemical substance in acting adversely or deleteriously on the body (1). In many countries, poisoning is a major public health hazard and the most common cause of hospital admissions (2). Furthermore, Poisoning cases are increasing day-by-day due to changes in lifestyle and social behavior (3). World

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Health Organization (WHO) estimated 0.3 million people die every year due to various poisoning agents (4, 5).

Acute poisoning is the reason for hospitalization for a major portion of patients admitted to emergency departments worldwide (5). Also acute poisoning is a worldwide problem and could be intentional or unintentional. The unintentional or accidental poisoning is common among children and contributes to increased childhood morbidity and mortality. Adults do also get poisoned through intentional poisoning that could be a suicidal attempt (6). Although poisoning is considered a global problem, the nature of the poisoning in developed and developing countries is different, due to the variation in access to poisonous substances. Moreover, access to poisonous substances depends on demographic characteristics, social beliefs and customs, education, economic status of family, and ease of access to opium and drugs (7). In high income countries such as Norway, benzodiazepines, ethanol and paracetamol are the most common causes of poisoning (8). Different reports of poisoning in Iran indicate that the leading causes of poisoning or chemical injury in Iran are accidental cases followed by drugs poisoning and pesticides exposure, respectively (9, 10). Therefore, the knowledge of the general pattern of poisoning in a particular region would help in early diagnosis and management of poisoning, which in turn should result in a reduction of morbidity and mortality (4, 11). The aim of our study was to analyze data from acute adult poisoning cases admitted to 5thAzar Hospital in Gorgan, in order to identify the trends and characteristics as well as to provide guidance on the investigation of such cases and help develop strategies to prevent the occurrence of poisoning.

2. Materials and Methods

2.1 Data source

This descriptive cross-sectional study was conducted on all adult (aged 10 and above) patients admitted for acute poisoning who are hospitalized in 5thAzar Hospital in Gorgan, the most populous city in the Golestan province, north part of Iran , during the 7 years from March 2008 to March 2015. In this study, all patients with acute poisoning diagnosis were investigated and those with non-definitive diagnosis were excluded. Patients with incomplete information and those who left the hospital against medical advice were also excluded. The diagnosis of poisoning was based on history given by the patients or their entourage and clinical examination.

The data including demographic profile of patients, type of toxic agent used, time of exposure to poison, time interval between poisoning and hospitalization, duration of hospital stay, nature and class of poison, clinical manifestations of patients, treatments delivered to patients, outcome and circumstances of poisoning were obtained from medical records.

2.2 Analysis

Data were analyzed using Stata software (version 11) and results are presented as frequency and percentage with charts and tables. The quantitative and qualitative data were analyzed by Pearson's Chi-square and Fisher's exact test, respectively. Also, P- values less than 0.05 were considered statistically significant.

2.3 Ethics

Confidentiality of patients' information was maintained when the data were obtained from the medical records. Ethical clearance was taken from the institutional ethics committee of Golestan University of Medical Sciences (Gorgan - Iran) before initiation of this research project.

3. Results

3.1 Demographic features

During the study period, Out of 195913 patients who hospitalized in 5thAzar Hospital 800 were poisoned, this was 0.4% of the total admissions and it means that the prevalence of poisoning were 0.4%. A total of 800 admitted cases of acute poisoning were included in this study, 447 cases (55.88%) were men**.** So, the majority of patients were men (447, 55.88%) and male to female ratio was1.3: 1. Minimum and maximum age of the study population was 12 years and 88 years, respectively. Mean age of patients was 31.03 ± 16.49 (Men 31.6± 16.2, Women 30.2±16.8) and most patients were in the age group of 20 to 29 years age old (352, 44%). Regarding occupation, businessmen were the most frequent (210, 26.25%) and most patients (352, 44%) had high school educational levels. 75.38% of cases lived in urban areas and 46.75% of the cases were married. There were significant differences between poisoning and demographics characteristics including gender (P=0.001), age groups (P< 0.001), marital status (P< 0.001), employment status (P< 0.001), educational status (P< 0.001) and residence of cases (P< 0.001).

3.2 Exposure

In majority of cases, the route of exposure to poison was oral (744, 93%)(P< 0.001). Also, in most cases (70.26%), poisoning occurred in the home (P<0.001).The exposure mostly occurred between 12:00 pm to 6:00 pm in 34.5% of patients (P<0.001). In majority of cases(41.88%), the time interval between exposure with the toxin agent and the admission to the hospital was more than 3 hours (P= 0.373).With 223 (27.88%) patients, the highest rate of admission for acute poisoning was reported in summer (P= 0.027). Also, hospitalization time was between 24-72 hours in 41.25% of patients and most cases of poisoning occurred on Sunday (16.88%). Maximum number of poisoning cases were observed during the months of Jun (9.63%), Feb and Oct (9%)(P= 0.026).

3.3 Types and Circumstances of poisoning

The most common causes of poisoning included: drugs (573, 71.62%), pesticides (85, 10.63%), opium (70, 8.75%), amphetamine compounds (23, 2.88%), bite (13, 1.63%) and others (36, 4.5%) (P<0.001). Our findings also reveal that the most common drug involved in poisoning (single drug or combination of drugs) were sedatives-hypnotics (231, 40.31%), narcotic drugs (171, 29.84%) and antidepressants (85, 14.835), which among them, benzodiazepines (213, 37.17%), tramadol (99, 17.27%) and Tricyclic Antidepressants (TCA_S) (64, 11.16%) were the most common, respectively.

In 8.02% of cases, the drug agents could not be identified. Poisoning with drug among women was greater than that among men, contrary about another poisoning agent, poisoning in men greater than among women (p=0.000). Also, the most common pesticides involved in poisoning were aluminum phosphide (53, 6.63%) and organophosphates (32, 4%).The peak age for poisoning such as drug, aluminum phosphide and organophosphates was 20-29, but opium poisoning was increased by age (P=0.000).The poisoning cases by agent and type is shown in figures 1 and 2.

3.4 Intention of poisoning

Most of poisoning cases (68.62%) occurred following intentional attempts (suicidal) (Fig 2). Suicidal tendency was greater in females (51%) than males (49%).The majority of suicides (50.27%) occurred in the 20-29 years age group. Also, in the suicide group, the mean age was 25.25 (SD=8.80) years. Moreover, familial disharmony was the main cause of suicidal attempts (31.60%).When considering intent, the number of deaths caused by intentional poisoning was the greatest, with 21 deaths (55.26% of all poisoning deaths).

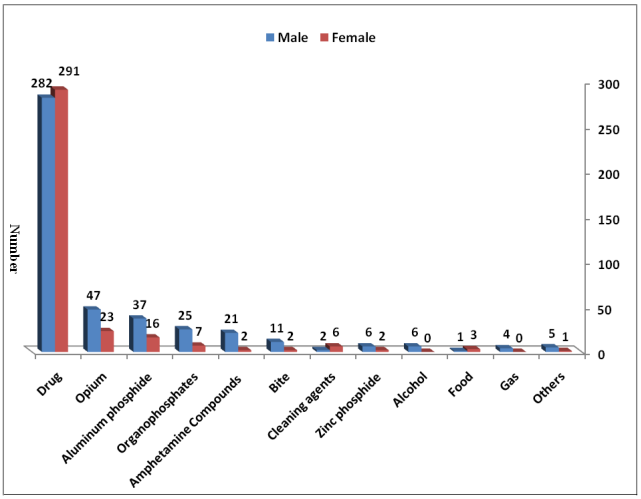


Figure 1. Number of poisoning by agent of poison, during March 2008 - March 2015, Gorgan, Iran.

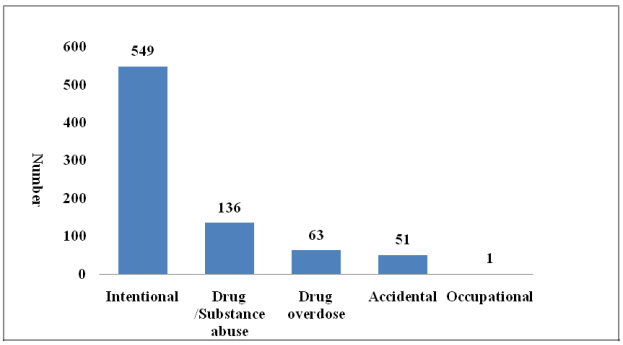


Figure 2. Types of poisoning during March 2008 - March 2015 in Gorgan, Iran.

3.5 Clinical findings

The frequency of clinical symptoms can be seen in Figure 3. Studying clinical symptoms showed 12 patients (1.5%) were asymptomatic. Moreover, neurologic manifestations were the most common findings (77.75%) (single or combination of symptoms per case).

3.6 Treatment and Outcome

Charcoal and sorbitol were given to 398 patients (49.75%). Also, the procedure of gastric lavage was done for 365 patients (45.62%). Moreover, specific antidotes were given to 184 patients (23%). After the management of poisoning, 78% of the patients got recovered, 17.25%

got discharged with self - satisfaction and 4.75% died, including 29 men (76.31%) and 9 women (23.68%) (P=0.032) and fatality rate was 4.75%. According to class of toxic agents, most deaths were among patients who were poisoned with Aluminum Phosphide (16, 42.10%) (Fig 4) and the majority of patients (31.57%) were in the 20-29 year age-group (P=0.000). In the current study 42.87% of patients were admitted to the Intensive Care Unit (ICU) ward. Furthermore, Glasgow Coma Scale (GCS) score (level of consciousness) ≤8 were seen in the 12% of patients (when entering the hospital).

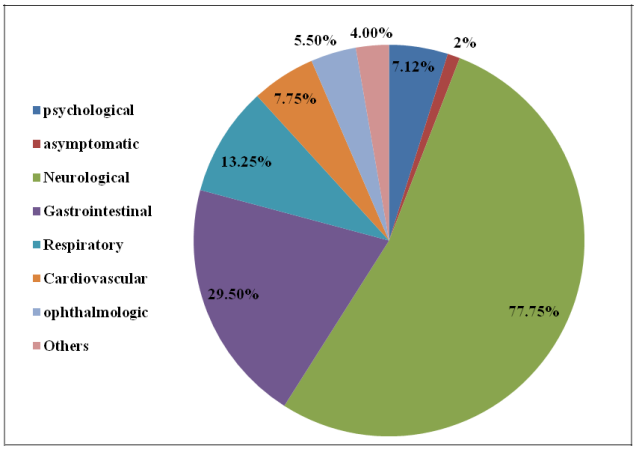


Figure 3. Clinical symptoms of poisoning during March 2008 - March 2015, Gorgan, Iran (one or more symptom per case).

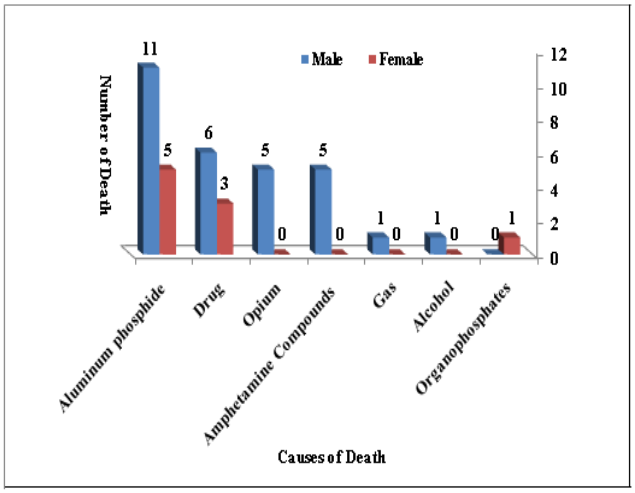


Figure 4. Death distribution of poisoning during March 2008 - March 2015, Gorgan, Iran.

4. Discussion

Poisoning is an important public health problem and a frequent cause of admission into hospitals. The aim of this study was to identify the trends and characteristics of poisoning in Gorgan.

In the present study, the majority of those poisoned were men(in all types of poisoning cases).This finding is in agreement with some published studies such as Palestine (6), Uganda (12), India (11) and Norway (5, 13). This can be due to the fact that men are more exposed to stress and dangerous environmental conditions (3). Moreover, this discrepancy might be related to socio-economic characteristics of each region (14). On the contrary, most intentional poisoning were made by women , similar findings have been reported by surveys done in the Iran (1, 15, 16) and USA (11, 17).Also, Zhang et al similarly found that suicide attempts including suicidal poisonings are more common in women in China (14).They speculated that marital problems are the major causes of suicide in women. Moreover, economic pressure which is the main motivating factor for suicide in men increases after marriage especially in countries experiencing economic tensions (14, 18). Also, socio-psychological problems such as marital disharmony, family conflicts and loss of family members are more intolerable for women (14).

The present study shows that the highest number of patients belonged to the age group of 20 to 29 years with a secondary peak seen in the age group of 10 to 19 years that resembles the age pattern of poisoning which was found by other researchers (12). Also, this result is in contrast to what is reported in some other parts of the world, in developed countries, such as Spain ,Germany, USA and Norway (1).This is probably due to the stress of modern life-style, interfamily conflicts and high unemployment rates especially among young population.

Furthermore, a significantly higher frequency of poisoning was seen in married patients which was in contrast to other studies conducted in Bangladesh and India (4, 19, 20) and is similar with the study done in Iran (1).

In our study, the majority of poisoning cases were seen during summer, which is in agreement with recent studies conducted in India and Palestine (6, 21). This is probably

due to the mood fluctuations seen during the summer months and the problems that occur when students are on holiday (such as graduation, worse school reports and so forth). Hormonal changes that cause moods to fluctuate are also associated with increased rates of depression, which are of the main risk factors associated with attempted suicide, especially among young people (22).

Poisoning cases in urban areas in present study were higher than in rural areas, similar to studies done in other parts of Iran and abroad (1, 15), it may reflect the increasing economical and psychological stress or strains due to living difficulties as well as problems associated with immigration from villages and unemployment in cities (1).

In our study, the majority of poisoning cases were caused by drugs , similar to reports from Iran (1,15, 23, 24) , In the majority of reports from Europe (22, 25-27), USA (28) and Asia (29, 30).A study in Iran showed that 60.8% of the poisoning cases admitted to a hospital in Tehran were because of medications (1).Among drug-related poisonings, benzodiazepines were the most common cause of drug poisoning.

We think that the reason for such a high ratio of drug poisoning is probably the extensive prescribing of these drugs in Iran and their easy availability at homes, because they can be found in high quantity in most household medicine cabinets. Furthermore, most of these drugs are sold without a prescription (1).

Drug poisoning is a common method for committing suicide in Sweden and it occurs due to prescribed drugs among the elderly old age and Over-the-counter (OTC) drugs in the young population. Benzodiazepines and antidepressant drugs account for about one third of drug-related poisoning cases. Some studies have shown that benzodiazepines alone are the most commonly-used drugs in committing suicide (31).This is because in Iran, most medications are cheap and easily available in markets.

Moreover, pesticide (such as organophosphate and aluminum phosphide) and opiate intoxications were also commonly observed, similar to reports from another part of Iran such as Tabriz (1).

In our study, intentional poisoning (suicide) was more common than another poisoning, similar to reports from another places (1, 15, 23, 32, 33). These results are in contrast to those reported from some European countries, where the majority of poisonings were accidental (12, 33, 34).

The high rate of intentional poisoning in the Iranian studies may be due to many factors such as increase in unemployment, urbanization, breakup in family support system, and economic instability (1). Moreover, in our study, the majority of suicide attempters were young single from another places may be due to some social and familial problems such as family quarrel, mental disorder, love and emotional problems and others.

In our study mortality rate was 4.75%, this mortality rate was more than the results reported from some parts of Iran (24, 33), it may be due to decrease of public awareness, low facilities and delays in transferring patients to hospitals. Moreover, aluminum phosphide was found to be responsible for maximum mortalities in males and females. Reports available from certain Asian (Pakistan and Sri Lanka) and African countries (Uganda) describe organophosphates and drugs as the commonly abused toxic substances with reported mortality rates varying from 2.0% to 2.1% (1).

Also, mortality due to poisoning depends on various factors including age, toxicity of the poison, amount consumed, health status of the patient, early hospitalization and proper management (35).

5. Conclusion

In the present study, intentional poisoning by pharmaceutical agents were identified as the main cause of poisoning .In addition, in this study, it was ascertained that age group of 20 to 29 years, being businessman or unemployment, living in urban, medium educational level, being married and people who suffering from family quarrel were significantly correlated to poisoning. Finally, people with these characteristics should be targeted for prevention and educational programs against intentional poisoning.

5.1 Limitation

In this study, data were not directly collected by the researchers and were collected retrospectively with questionnaires, which may cause bias in data collection.

6. Acknowledgements

This article was approved and financially supported (code: 630611111) by the Golestan University of Medical Sciences (Gorgan – Iran).The authors would like to thank

all staff of 5thAzar Hospital and Health Management and Social Development Research Center for their kind cooperation.

7. Conflict of Interest

The authors declare that there is no conflict of interest.

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