ORIGINAL ARTICLE

Acute Poisoning in Elderly; a Five-Year Study (2008-2013) in Hamadan, Iran

SAEED AFZALI[1,*], MOHAMMAD ALI SEIFRABIEI[2], SEYED KAZEM TAHERI[1], JAHANGIR POURABDOLLAH[3]

[1] Department of Forensic Medicine and Toxicology, School of Medicine, Hamadan University of Medical Sciences, Hamadan, Iran

[2] Department of Community Medicine, School of Medicine, Hamadan University of Medical Sciences, Hamadan, Iran

[3] School of Medicine, Hamadan University of Medical Sciences, Hamadan, Iran

Abstract

Background: A good proportion of poisoned patients treated at poisoning wards are elderly. This study was designed to evaluate the epidemiologic pattern of acute poisoning in elderly in Hamadan, western Iran.

Methods: In this retrospective cross-sectional study, poisoned patients aged 60 years and older treated at department of poisoning of Farshchian Hospital from March 2008 to March 2013 were included.

Results: In this 5-year period, 7951 poisoned patients were treated at Farshchian Hospital in Hamadan, Iran. Among them, 418 (5.3%) patients were 60 years old or older, with mean age of 71.6 ± 5.1 years. Narcotics and recreational substances were the most common type of poisons responsible for poisoning (46.4%), which among them, methadone was the most commonly used drug (20.3%). Neurologic medicines were the most commonly used pharmaceutical products (16%), among which, benzodiazepines (8.9%) were responsible for the highest number of poisonings due to pharmaceuticals. Fifteen patients (3.6%) including 13 men and 2 women died. The toxic agents used by cases with fatal outcome were opioids (8 patients), organophosphates (5 patients) and aluminum phosphide (2 patients). Men were found to be significantly more affected with recreational substances (P < 0.001) and pesticides (P < 0.001), while poisoning with pharmaceutical products (P = 0.017) was significantly more common in women. Regarding the intention of poisoning, accidental poisoning (P = 0.025) and overdose (P < 0.001) were significantly more common in men while deliberate self-poisoning was significantly more frequent in women (P < 0.001).

Conclusion: Deliberate self-harm and poisoning with opioids especially methadone showed a high prevalence in elderly poisoned patients in Hamadan, Iran. It seems that drug trafficking control, addiction rehabilitation therapies and suicide prevention programs for elderly can be helpful in poisoning reduction in this age group in this part of the country.

Keywords: Aged; Iran; Methadone; Opioid-Related Disorders; Poisoning

INTRODUCTION

Aging is a phenomenon caused by biologic, physiologic, anatomic and biochemistric changes (1). There are several classification about the beginning of elderly, but according to common definitions, it usually begins at the age of 60 years (2,3).

Globally, more than 800,000 people die due to suicide annually. The highest suicide rates have been spotted among people aged 70 years and higher across the world (4). Acute chemical and drug poisoning has been considered as the third most common cause of mortality among Iranians who committed suicide, after hanging and self-burning (5).

Among large number of patients referred to emergency departments due to poisoning each year, some are elderly patients (6). Elderly poisoned patients are at very high risk of morbidities and mortality (6,7). Poisoning may be caused by drugs, substances of abuse and chemical agents. Annually a considerable number of elderly with acute poisoning are treated at Farshchian Hospital in Hamadan, western Iran. Hence, this study was designed to evaluate the epidemiologic pattern of acute poisoning in elderly patients in this part of Iran.

METHODS

In this retrospective cross-sectional study, poisoned patients aged 60 years and older treated at department of poisoning of Farshchian Hospital from March 2008 to March 2013 were included. Farshchian Hospital is a referral medical setting for poisoned patients in Hamadan province, which serves to about 1,758,268 people, of whom 10% are elderly.

Ethics board approval was obtained and patients' records were reviewed by maintaining the confidentiality of their personal information and the data were only provided and presented with the purpose of epidemiologic analysis. Demographic features of patients, type of toxic agents,

circumstances of poisoning and outcomes were recorded into predesigned checklists. Diagnosis was based on history, clinical findings and toxicological tests. Type of toxic agents was mainly identified according to the history taken from patients or their relatives.

Data were analyzed using SPSS software. Chi squared test was used to compare type of poisons used and intention of poisoning between men and women. A p value less than 0.05 was considered to be statistically significant.

RESULTS

Demographics

In this 5-year period, 7951 poisoned patients were treated at Farshchian Hospital in Hamadan, Iran. Among them, 418 (5.3%) patients were 60 years old or older, with mean age of 71.6 ± 5.1 years. The majority of patients (71.2%) were between 65-74 years of age (Table 1). Most patients were married (93.8%). Regarding the occupational status, the highest proportion of patients were self-employed (41.9%). Given the educational status, most patients did not complete high school (97.4%).

Circumstances of poisoning

Regarding the admission time, most patients were admitted in summer (33.5%) followed by winter (26.6%), spring (23.2%) and autumn (16.7%). The intention behind poisoning was deliberate self-harm in the majority of cases (38.3%), followed by accidental poisoning (31.1%), drug overdose (29.9%) and homicidal poisoning (0.5%). With respect to the route of exposure, the majority of poisonings occurred by oral intake (65.8%), followed by inhalation (32.3%), injection (1.4%) and body packing (0.5%).

Type of poisons

Narcotics and recreational substances were the most common type of poisons responsible for poisoning (46.4%), which among them, methadone was the most commonly used drug (20.3%) (Table 2). Neurologic medicines were the most commonly used pharmaceutical products (16%), among which, benzodiazepines (8.9%) were responsible for the highest number of poisonings

Table 1. Demographic features of elderly patients with acute poisoning treated at Farshchian Hospital, Hamadan, Iran during 2008 to 2013 (n = 418)

Variable	N (%)
Sex	
Male	312 (74.6)
Female	106 (25.4)
Age groups (year)	
60-64	35 (8.4)
65-69	145 (34.7)
70-74	153 (36.6)
75-79	82 (19.6)
>80	3 (0.7)
Marital status	
Married	392 (93.8)
Single	26 (6.2)
Occupation	
Self-employment	175 (41.9)
Housewife	95 (22.7)
Retired	70 (16.7)
Farmer	43 (10.3)
Unemployed	35 (8.4)
Education	
No formal education	1 (0.2)
Incomplete high school	407 (97.4)
High school diploma and above	10 (2.4)

Table 2. Toxic agents responsible for poisoning in elderly patients treated at Farshchian Hospital, Hamadan, Iran during 2008 to 2013 (n = 418)

Poison/toxin class	N (%)
Pharmaceutical agents	
Neurologic medicines	
Benzodiazepines	37 (8.9)
Cyclic antidepressants	14 (3.3)
Antipsychotics	11 (2.6)
Selective serotonin reuptake inhibitors	3 (0.7)
Antiepileptics	2 (0.5)
Acetaminophen	5 (1.2)
Antimicrobials	2 (0.5)
Antihistamines	2 (0.5)
Total	76 (18.2)
Narcotics and recreational substances	
Opioids	
Methadone	85 (20.3)
Raw opium	43 (10.3)
Tramadol	19 (4.5)
Heroin	10 (2.4)
Psychostimulant	
Amphetamine-like	37 (8.9)
Total	194 (46.4)
Chemical poisons	
Household items	
Detergents	32 (7.7)
Cosmetics	11 (2.6)
Pesticides	
Organophosphates	46 (11.0)
Zinc Phosphide	15 (3.6)
Paraquat/Diquat	7 (1.7)
Aluminum Phosphide	2 (0.5)
Total	113 (27.0)
Not clearly identified or diagnosed	35 (8.4)
Total	418 (100)

due to pharmaceuticals. In the class of chemical poisons, organophosphates (11%) were the most frequent cause of poisoning followed by household items (10.3%).

Outcomes

Fifteen patients (3.6%) including 13 men and 2 women died. The toxic agents used by cases with fatal outcome were opioids (8 patients), organophosphates (5 patients) and aluminum phosphide (2 patients).

Comparative analysis according to gender

Given the type of poisons used, there was a statistically significant difference between men and women; i.e. men were found to be significantly more affected with recreational substances (P < 0.001) and pesticides (P < 0.001), while poisoning with pharmaceutical products (P = 0.017) and unknown items (P < 0.001) were significantly more common in women. Based on intention of poisoning also, statistically significant differences between men and women were found, i.e. accidental poisoning (P = 0.025) and overdose (P < 0.001) were significantly more common in men while deliberate self-poisoning was significantly more frequent in women (P < 0.001) (Table 3).

DISCUSSION

The results of this study revealed that the most common reason for poisoning in elderly in Hamedan was drug abuse. In this study, the number of male patients was higher than females, which is similar to the results of the study by Hu et al in China (8) and Karbakhsh et al in Tehran, Iran (9); however, it was country to the Klein-Schwartz and Oderda's findings in the United States where women outnumbered men in elderly poisonings (10). This difference can be explained by cultural factors and gender oriented pressures toward men or women in different parts of the world.

The majority of our patients aged between 65-74 years with an average of about 72 years. This was relatively close to the mean age of patients in the studies by Mühlberg et al in Germany (~75), Hu et al in China (~77), Miranda Arto et al in Spain (~74) (7,8,11).

Deliberate self-harm was the most common intention behind poisoning in this study. Similarly, Hu et al showed suicidal poisoning as the most common cause of poisoning (8). In addition, most of our patients were married, which was consistent with findings by Khodabandeh et al (12) and Hu et al (8). Marital problems and relevant economic pressures might be the cause of poisoning especially suicidal poisoning as Zhang et al ascertained in their study (13).

Moreover, in our study, most patients had incomplete high school education. In this context, Sarkar et al reported that the majority of poisoned patients referred to a tertiary hospital in India had low educational level (primary or secondary education) (14). These finding can be explained by the fact that perhaps low-educated patients were not aware of drugs side effects or their appropriate dose.

In the present study, methadone was the most commonly used poison responsible for poisoning in elderly. In a recent study, Soltaninejad et al highlighted that methadone-related poisonings is on the rise in our country (15). This is somehow due to the prevalence of opioid dependence in Iran which is the result of proximity to countries with high opiate production such as Afghanistan (16). In China and Germany; however, poisoning with pharmaceuticals was more common among elderly (7,8). Hu et al, Krabkahsh et al and Miranda Arto et al found benzodiazepines as the most commonly abused medicine for poisoning in elderly (8,9,11), which is in agreement to our findings.

The mortality rate in our study was 3.6%. This was much lower than the mortality rate in the studies by Hu et al (6.9%) and Karbakhsh et al (11.7%) (8,9). The most common cause of death in our study was opioid overdose which replicates the findings by Karbakhsh et al (9).

LIMITATIONS

The retrospective nature of the study is one of the major limitations. The type of poisons reported in this study was mainly based on patient's history which somehow undermines the accuracy of data.

Table 3. Comparative analysis of toxic agents used according to gender

	Gender		
	Male (n = 312)	Female (n = 106)	P value
Type of poisons			
Substance of abuse; n (%)	170 (54.5)	24 (22.6)	< 0.001
Pharmaceutical products; n (%)	18 (5.8)	58 (54.7)	< 0.001
Pesticides; n (%)	65 (20.8)	5 (4.7)	< 0.001
Household items; n (%)	27 (8.7)	16 (15.1)	0.059
Unknown; n (%)	32 (10.2)	3 (2.8)	0.017
Intension of poisoning			
Deliberate self-harm; n (%)	81 (26.0)	79 (74.5)	< 0.001
Overdose; n (%)	122 (39.1)	3 (2.8)	< 0.001
Accidental; n (%)	107 (34.3)	24 (22.6)	0.025
Homicidal; n (%)	2 (0.64)	0 (0.0)	0.557

CONCLUSION

Deliberate self-harm and poisoning with opioids especially methadone showed a high prevalence in elderly poisoned patients in Hamadan, Iran. It seems that drug trafficking control, addiction rehabilitation therapies and suicide prevention programs for elderly can be helpful in poisoning reduction in this age group in this part of the country.

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