

Alcohol Intoxication: An Emerging Public Health Problem

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Abstract

Background: Alcohol-related disorders are among major public health problems around the world. We aimed to focus on the trends of alcohol intoxication in Mashhad for the recent seven years.

Methods: Registry database was analyzed. All admitted cases with alcohol-related intoxication were included during 2004 to 2011. Two national censuses were used for rate calculation.

Results: There were 772 admissions due to alcohol (ethanol and methanol) intoxication (1.6% of all poisonings which equals to a prevalence rate of 3.3 per 100,000) during the 7-year period. Mean age was 25±11.9 years, and 90% of subjects were male. Alcohol intoxication prevalence was tripled as compared to 2004. Case fatality rate was higher in women (7.5% vs. 6.6%). Males who were self-employed or unemployed and females who were housekeepers or students were at greatest risk. The age-specific prevalence rate was highest in 10-20 (6.25 per 100,000), and the age-specific mortality rate was highest in 30-40 (2.13 per 100,000) age group.

Conclusion: It seems that current health policies need to improve regarding complications of alcohol use in the area to effectively control the increasing rates. Further national studies are warranted.

Keywords: Alcohol; Epidemiology; Poisoning

How to cite this article: Khadem-Rezaiyan M, Afshari R. Alcohol Intoxication: An Emerging Public Health Problem. *Asia Pac J Med Toxicol* 2017;6:1-5.

INTRODUCTION

Alcohol-related disorders are among major public health problems around the world (1-3). Alcohol use is a causal factor for more than 200 disease and injury conditions including various cancers, unipolar major depression, epilepsy, hypertensive disease, hemorrhagic stroke and cirrhosis of the liver, coronary heart disease and unintentional and intentional injuries (4-8).

Although alcohol-related problems have been confined in Islamic countries due to religious and legal issues, alcohol is still smuggled into the country or illegally homemade and distributed in the black market (9). Considering this issues through public health lens the first official alcohol misuse report and treatment models has been issued by Iranian Ministry of Health and Medical Education just a few years ago (10-12).

World Health organization (WHO) has estimated that average alcohol yearly consumption is low and about 1 L per person in East Mediterranean Region including Iran, due to lifelong abstinence of a major part of the population. However, total alcohol consumptions for drinkers of 15 years and older age in this region is estimated to be 25 L per person per year, which is higher than many European countries (13). This indicator had raised dramatically in recent years (6).

Few cross-sectional studies have been focused on

substance use and especially alcohol consumption in adults in Iran (14,15). No widespread epidemiologic study on alcohol use induced health problems exists in Mashhad in the literature. The aim of this study is to evaluate the trends and epidemiologic findings of alcohol intoxication in Mashhad.

METHODS

This cross-sectional study was performed in Khorasan Razavi province (largest province in northeastern Iran), which occupies about 118,884 square kilometers of the country. Nearly eight percent of Iran's total population (six million) is living in Khorasan Razavi.

Data were analyzed across a 7-year period, from March 20, 2004 to March 21, 2011. We included all cases of alcohol related intoxication which were admitted in the single toxicology department of the province (referral). These cases were classified based on the International Classification of Diseases, Tenth Revision (ICD-10). Data were analyzed by annual trends, age, gender, marital and occupational status, and time in which the alcohol intoxication happened as well as the outcome of treatment. Calculation of rates per 100,000 inhabitants of Khorasan Razavi province was performed using census data for the year 2006 (16).

SPSS version 11.5 was used for data analysis. Descriptive analyses are presented with frequency (percentage) and mean (standard deviation). Independent sample t-test and Chi-square

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Received 18 November 2016, Accepted 5 February 2017

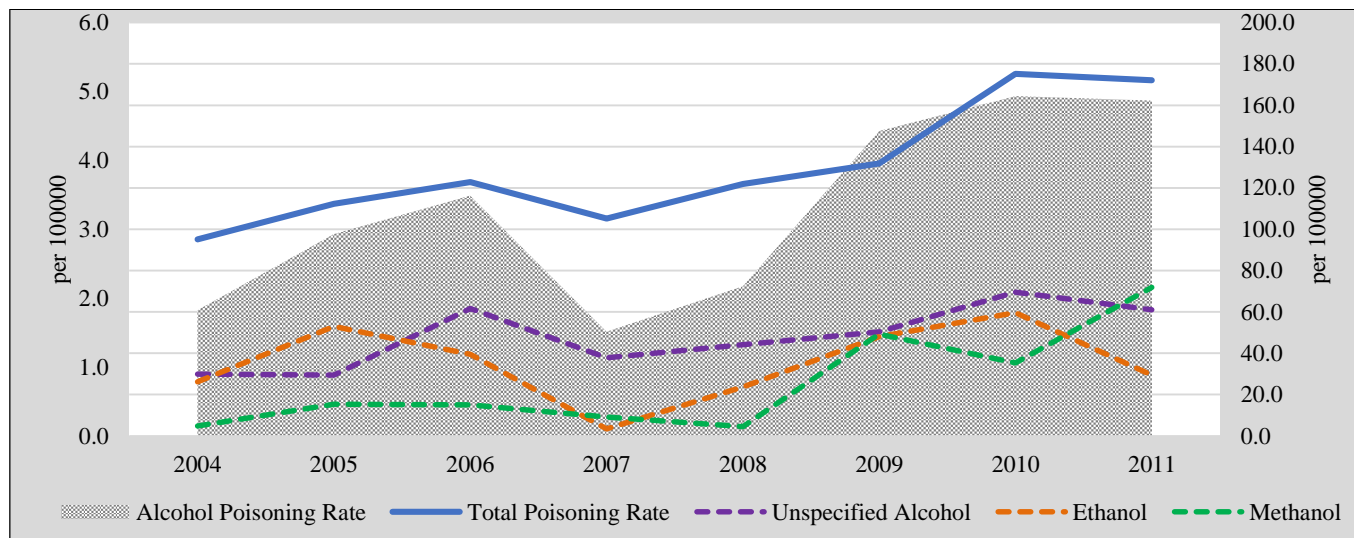


Figure 1. Total poisoning rate (right axis) and alcohol (total and subgroups) poisoning rates (left axis) in Khorasan Razavi province during 2004-2011

test were used for inferential analysis. $P < 0.05$ was considered statistically significant.

RESULTS

Annual trends

There were 772 (1.6%) admissions due to alcohol intoxication during 2004 to 2011 which equals to a prevalence rate of 3.3 per 100,000. Two hundred and forty-nine (32%) admissions were due to Ethanol (prevalence rate: 1.0 per 100,000), and 184 (24%) were due to Methanol intoxication (prevalence rate: 0.7 per 100,000). There was also 339 (44%) admissions which were classified as unspecified (prevalence rate: 1.4 per 100,000). Figure 1 shows that alcohol intoxication had approximately followed the same pattern as total poisoning rate: total prevalence rate had nearly doubled (from 95 to 172 per 100,000), but alcohol intoxication prevalence had tripled (from 1.8 to 4.9 per 100,000). Although Methanol have had the lowest prevalence rate, but it has been increased in the last years of study period. The highest rate of admissions happened in 2010 (19%). More than 86% of alcohol intoxicated patients were fully recovered with no complications. Methanol (21%) had a much higher case fatality rate than ethanol (2%) poisoning.

Gender

Over ninety percent of cases ($n=694$) were male. Case fatality rate was 6.6% in men and 7.5% in women among admitted cases. This is equal to a mortality rate of 2.5 and 0.34 per 100,000 in male and female populations, respectively. Although prevalence rate was higher in males, both had followed a similar pattern. (Figure 2) Ethanol toxicity was significantly greater in women: 46% vs.31% ($p=0.024$).

Age

Mean (SD, min-max) age of admitted patients was 25(12, 1-89) years. Admitted men were significantly older than women ($p=0.045$)(Figure 3).

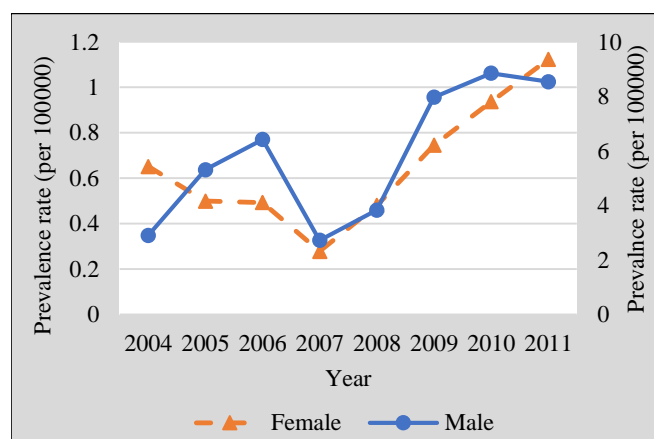


Figure 2. Prevalence rate of alcohol intoxication in two genders (Female: left axis, Male: right axis) from 2004 to 2011

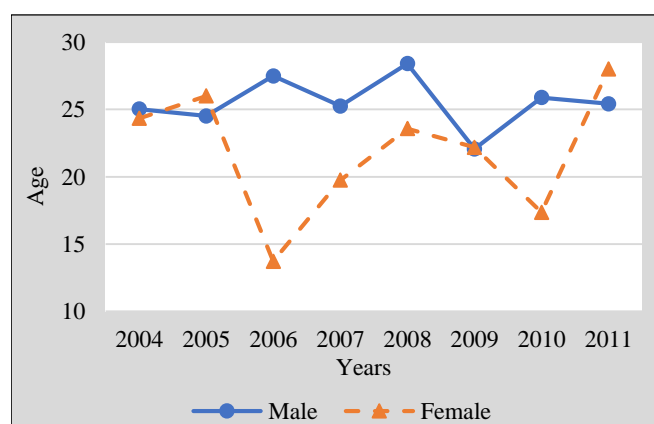


Figure 3. Mean of age in two genders from 2004 to 2011

Most patients were in 20-30 age group (324, 42%). However, the highest age-specific prevalence rate (ASPR) was in 10-20 years followed by 20-30 age groups. Males had a higher rate of admission compared to females in all age groups except below 10 years old. ($p < 0.001$) (Table 1) Although most deaths were in 20-30 age group, ASMR was highest in 30-40 years. Figure 4 shows a comparison and relationship of ASPR and ASMR.

Occupational and marriage status

Sixty-two percent ($n=295$) of cases were single: 52% of Methanol and 67% of Ethanol intoxications. The occupations with the highest incidence of alcohol intoxication were self-employed (319, 60%) and unemployed (64, 12 %) in men. In females, housekeepers (34, 74%) and students (4, 9%) had the highest ranks. Data stratification based on alcohol type revealed that self-employment had the first rank in both methanol and ethanol poisoning, but the second rank for methanol and ethanol poisoning were unemployment and students, respectively.

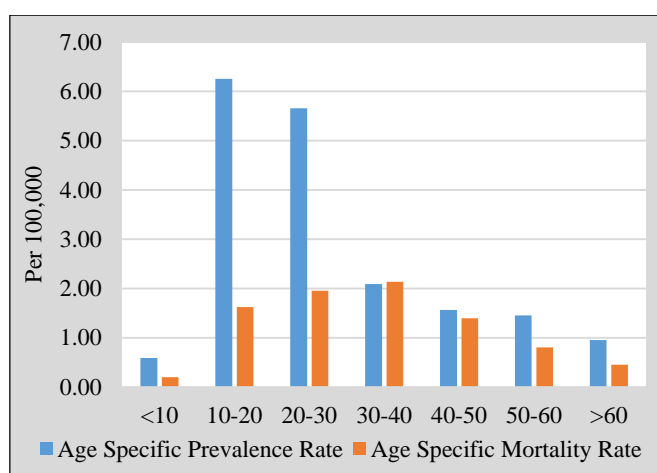


Figure 4. Age-specific prevalence and mortality rates in different age groups (2004-2011)

Time

Most admissions (21%) happened during the weekend, which Fridays in this country. Winter (27%) and especially March [Persian New Year] (11%) as a single month had the highest point prevalence rates. Women were mostly admitted in summer and September, but male admissions were mainly in winter and March ($p=0.043$ and $p=0.011$, respectively). Methanol and Ethanol related admissions were highest in spring (28%) and summer (27%), respectively ($p=0.046$). Figure 5 shows that the ratio alcohol poisoning to poisoning due to all causes is highest on Fridays. Methanol, Ethanol had the same pattern.

DISCUSSION

Admissions due to alcohol related intoxications between 2004 and 2011 were analyzed in this study. Over this period, alcohol intoxication was attributed to 772 poisoning and 42 deaths. Although the results of this study showed that alcohol-related admissions rate has tripled during these years, but we do not have a reliable estimation for alcohol use in the country.

Available studies of alcohol use have been focused on high-risk groups including students. In one study, which was performed in the northwest of Iran, 16% of students in the dormitory had alcohol consumption out of which 9% had heavy drinking on each occasion (1). Alcohol use is reported to be 55% in IV drug abusers (17). Another study in Shiraz (South of the country) had indicated that 25% of students had tried alcohol at least once in their life (18). A larger multi-center study in Tabriz (northwest of Iran) reported that 8% of students had alcohol consumption in the past 30 days. Although these prevalence rates are considerably lower than other countries like America (60% of college students reported past month alcohol use) (19), and Bangladesh (1.9% of general population)(20), still alcohol and substance abuse can be overcome by creating a more stress-free academic environment for students, facilitating a wider range of social and recreational activities, setting up alcohol and drug awareness and counselling programs(21). In this study, we

Table 1. Number of admissions and deaths in two genders alongside with age-specific prevalence and mortality rates

Age groups	Admission		ASPR ($\times 10^5$)	Mortality		ASMR ($\times 10^5$)
	Male	Female		Male	Female	
< 10 years	10 (42)*	14 (58)	0.59	1 (100)	0 (0)	0.20
10 - 20 years	233 (94)	14 (6)	6.25	7 (88)	1 (12)	1.62
20 - 30 years	292 (91)	30 (9)	5.66	13 (93)	1 (7)	1.96
30 - 40 years	75 (87)	11 (13)	2.09	9 (82)	2 (18)	2.13
40 - 50 years	41 (91)	4 (9)	1.56	5 (100)	0 (0)	1.39
50 - 60 years	29 (100)	0 (0)	1.45	2 (100)	0 (0)	0.80
> 60 years	14 (82)	3 (18)	0.95	0 (0)	1 (100)	0.45
Total	694 (90)	76 (10)	2.65	37 (88)	5 (12)	1.22

*Data is represented as Frequency (percentage)

ASPR=Age Specific Prevalence Rate

ASMR= Age-Specific Mortality Rate

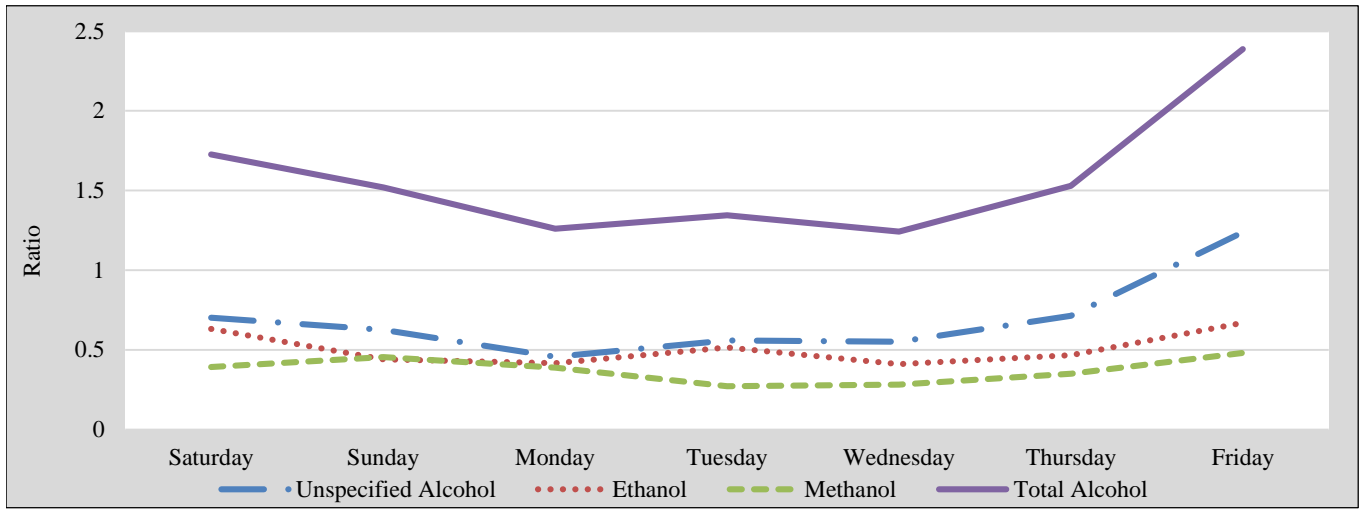


Figure 5. Ratio of alcohol (total and subgroups) poisoning to all poisonings in Khorasan Razavi province during 2004-2011

are reporting a far lower prevalence as well are focusing on medical complications related to alcohol abuse.

The majority of admitted patients were male which is congruent with other studies (19, 22-25). One study in Tabriz which was performed on college students estimated that being male can increase the chance of alcohol use in the past 30 days by 1.64 times (26).

Nationwide, alcohol consumption has been reported to be less than 10% in different surveys but can reach more than 10% in young men in some regions. The prevalence of alcohol dependency is much lower than alcohol use and was estimated to be 0.2% in 2010 (13). As alcohol is legally banned in Iran (27), home production (which leads to methanol production) is causing one-third of all alcohol-related intoxications. Half of alcohol users in one study (28) and 80% in another (29) reported to consume homemade alcohols. Besides, case fatality rate of methanol was approximately 11 times of ethanol. It has been reported that Methanol could have a 40% mortality or neurological sequelae (30). However, a 13-year study on toxic alcohol poisoning in Russia reported that Ethylene glycol had the highest hospital mortality (36%)(31).

Most admitted patients were in 20-30 age group which is similar to the report of Health Ministry of Iran (32). However, the highest ASPR was in 10-20 years. Normative transitions can explain these findings: results of cohort studies showed that alcohol use, marijuana use, and sex with multiple partners increased during the transition from high school to college (33,34). Fridays are weekend in Iran, in which most of admissions were happened on these days. This could be due to parties held by young adults which lead to overconsumption of alcohol. The notch in 2007, seems to be due to hospital management system as it has been found in our other study, too (35, 36).

It has been shown that both average volume of alcohol consumption and patterns of drinking influence alcohol-related burden of disease (4,25,37). Such data missing in Iran,

and further national studies are needed to cover this information gap. Besides, implementing the newly developed strategies (38) like harm reduction programs could also be a crucial step from a health as well as an economic point of view.

LIMITATION

This study was performed on a major referral hospital registry of the only toxicological department of northwest of Iran. Minor intoxicated individuals may not be referred to this hospital, and this may lead to an underestimation of prevalence rates. Although ethics prevent reporting alcohol use from the hospitals to the judiciary system, it is plausible that due to legal ban of alcohol use, fewer people are referred to the health authorities. This can also explain the high rate of “unspecified alcohol” usage. Also, mixed overdoses of alcohol could not be studied. Extended study period and generalizability, however, are two of strength points of this study.

CONCLUSION

Understanding the epidemiology of alcohol intoxications is crucial for resource allocation and increasing the awareness. We believe that these epidemiologic data and especially the trends can help health policy makers to implement appropriate interventions.

ACKNOWLEDGEMENT

We would like to thank Miss Mihandoust for her kind cooperation in the gathering of these data.

Conflict of interest: None to be declared.

Funding and support: None.

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