Alcohol Use Disorder in an Israeli General Hospital: Sociodemographic, Ethnic and Clinical Characteristics

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ABSTRACT: **Background:** Alcohol consumption in Israel has increased over the last 20 years. Patients with alcohol use disorder (AUD) who present at a hospital enable early intervention.
Objectives: To examine, for the first time, the characteristics of AUD patients in an Israel general hospital, and whether their alcohol use was documented in their files.
Methods: A group of 178 consecutive patients referred for psychiatric consultation was compared to a second group of 105 hospitalized patients who were not referred. These two groups were studied to compare risk factors for AUD. Patients in both groups were prospectively interviewed using a CAGE questionnaire, demonstrated as an effective screening instrument for AUD. Patients' files in both groups were examined for documentation of alcohol use.
Results: There was no significant difference between the prevalence of AUD in the two groups. The groups were then merged since no significant difference in the risk factor effects between the two groups was found. The risk factors for AUD in the final statistical analysis were lower educational status, living alone, being born in the Former Soviet Union and weaker religious observance. Post-traumatic stress disorder (PTSD), cigarette smoking and substance use were found to be independent risk factors. Soldier status was associated with significant alcohol misuse and AUD (CAGE1–4). Alcohol consumption was documented in the files of AUD patients in 48% of the first group and 21% of the second.
Conclusions: Physicians often neglect to take a history of alcohol consumption. Routine use of the CAGE questionnaire is recommended in Israeli general hospitals. Special attention should be given to PTSD patients and to soldiers.

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KEY WORDS: alcohol use disorder (AUD), general hospital, risk factors, screening

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Israel provides a valuable opportunity to study the interplay of genetic, sociocultural, environmental and religious determinants for alcohol use and abuse. Israel has been known for a very low alcohol consumption. Jews and Muslims are traditionally associated with a low prevalence of alcohol use disorder [1]. Muslim tradition prohibits the consumption of alcohol, while Jewish tradition permits alcohol consumption within religious ceremonial or secular contexts. In Israel there has been a rise in the use and abuse of alcohol over the last 20 years, which has been attributed, at least in part, to immigration from the former Soviet Union [1]. It has been suggested that a functional polymorphism of the alcohol dehydrogenase gene, *ADH2*2*, contributes to a difference in observed alcohol consumption between recent Jewish immigrants from the former Soviet Union compared to Israeli born Jews [2]. Significantly lower levels of this gene were found in the former Soviet Union immigrant group, thereby strengthening the hypothesis that this gene has a protective effect for heavy drinking and alcoholism.

Israeli youth [3,4], and in particular disadvantaged Ethiopian immigrants, have been identified as a high risk group for AUD [5]. With the increase in alcohol-related violence and traffic accidents in Israel today, government restrictions on the sale and consumption of alcohol have been implemented together with increasing public awareness of the dangers of alcohol and driving [6]. AUD includes alcohol abuse and alcohol dependence. This disorder is responsible for a wide range of physical and mental problems, and includes accidents and hospitalization [7].

Most patients with AUD seek medical help only when they experience physical symptoms, so referral to the emergency room or admission to a general hospital is an opportunity for intervention. Yet identification rates of alcohol use disorders in general hospitals by medical staff have been reported as ranging between 25.4% [8] and 50% [9]. The relative unawareness of alcohol use disorders by medical staff in general hospitals may in part be a product of the historical fact that alcohol-related morbidity has not been a serious problem in certain cultures [8].

Staff working in pediatric emergency rooms should be sensitive to the manifestations of alcohol use disorders in young persons. For example, a low level of consciousness in an adolescent who presents to the pediatric ER raises the likelihood that he/she suffers from alcohol or drug abuse [10].

Due to differences in metabolism of alcohol, women of all ages compared to men are at higher risk for negative, medical,

AUD = alcohol use disorder
ER = emergency room

social and psychological consequences of alcohol abuse [11]. In Israel there is also a lack of public awareness regarding fetal alcohol spectrum disorder, as well as inadequate professional knowledge and counseling services regarding this condition [12]. Demographic factors such as living alone [13], nicotine use and illicit substance abuse have been reported to be positively associated with AUD [14], while religious practice has been reported to be negatively related to AUD [15].

Studies performed in the United States military [16] demonstrated a relationship between soldier status, alcohol misuse and AUD. To our knowledge, there has been no other study of alcohol use disorder in an Israeli general hospital.

SUBJECTS AND METHODS

Between September 2007 and October 2008, two groups of patients in a university-affiliated general hospital were prospectively recruited. The Ethics Committee of the hospital provided approval for the research. Informed consent was obtained from adult patients who participated in the study. Consent was also obtained from both the minors who participated in the study and their parents.

The first group consisted of 178 patients who were referred for psychiatric consultation by their treating physician in the ER or the hospital ward. We wished to determine whether a correlation existed between psychiatric diagnosis and AUD, as was found in overseas studies that describe a significant comorbidity between psychiatric pathology and AUD [17]. Patients in the first group were recruited consecutively on a regular day on a weekly basis (Tuesdays). The second group comprised 105 hospitalized patients who were not referred for psychiatric consultation. The latter group was recruited to examine risk factors for AUD that were not related to psychiatric referral. The patients in the second group were randomly recruited from the ER and wards on a fixed day of the week (Tuesdays). Every patient was seen by a senior consultation liaison psychiatrist (J.M. or S.J.) and interviewed by means of the CAGE questionnaire.

Inclusion criteria for both groups included age above 14 and ability to communicate verbally, necessary for responding to questions in the CAGE questionnaire. Patients were excluded if they were unconscious, cognitively impaired, demented or suffered from mental retardation. Eight patients from the non-psychiatric group chose not to participate in the study. Patients in both groups included soldiers who were referred to the hospital by the military liaison unit.

The CAGE questionnaire [18] consists of four questions relating to alcohol use: a) **c**ut down the desire to reduce intake of alcohol, b) **a**nnoyed about criticism from others about one's alcohol use, c) **g**uilt about alcohol use, d) use of alcohol as an '**e**ye-opener' first thing in the morning in order to function. This tool has been demonstrated as an effective screening instrument for detecting lifetime history of alcohol abuse and dependence in the general hospital [19]. Since this test does not distinguish between active and past problem drinking it may be supplemented by questions related to current alcohol consumption during the last month.

In our study, patients who responded positively to one or more of the items on the CAGE were asked about their current and past alcohol consumption. In addition, a structured sociodemographic and clinical questionnaire was completed for every patient. Religious practice, cigarette use (more than 10 cigarettes per day) and educational status were only added to the questionnaire later, resulting in a reduced sample of patients who responded to these questions. Psychiatric diagnoses were made according to the Diagnostic and Statistical Manual of Mental Disorders (DSM IV TR) [20] criteria. The hospital file of every patient was examined for details of alcohol intake in the physician's admission notes.

STATISTICAL ANALYSIS

Descriptive statistics used numbers and frequencies for qualitative variables, and means and standard deviations for the quantitative variable (age). Relationships between qualitative variables and AUD were assessed using the chi-square test and Fischer's exact test. The relationship between AUD and age was examined using Student's *t*-test. The multivariate analysis was based on stepwise logistic regression. Four models were tested: the first one, model M1, was developed using all variables which were significant at the 0.10 *P* value level in the univariate analysis. Variables included ethnicity, drug abuse, nicotine abuse, PTSD and documentation of alcohol consumption. Variables significant at the 0.05 *P* value level by the Wald test were retained in the final model M1. Model M2 was developed from the subset of variables used for M1, but with a missing value rate lower than 10%. Models M3 and M4 were developed to verify that the merging of the two samples was valid. This was done by adding to the models M1 and M2, respectively, all the interaction factors between the retained variables and the original sample. This procedure allowed us to test the interactions by comparing models M3 and M4 with models M1 and M2, respectively. The models were pair-wise compared using maximum likelihood ratio tests. All the tests were two-sided, with a P value < 0.05 considered as significant. The computations were performed using the SAS V9.2 statistical package.

RESULTS

The mean age of the psychiatric consultation group was 34.9 ± 14.6 years and 38 ± 14.1 for the non-psychiatric consultation group [Table 1].

PTSD = post-traumatic stress disorder

Table 1. Demographic characteristics of patients

	Psychiatric consultation group (n=178)	Non-psychiatric consultation group (n=105)
Gender		
Female	87 (49%)	33 (31%)
Male	91 (51%)	72 (69%)
Age (yrs)	34.9 ± 14.6	38.8 ± 14.1
Religion*		
Jewish	128 (88%)	28 (82%)
Muslim	12 (8%)	5 (15%)
Christian	5 (4%)	1 (3%)
Practising religion*		
No	53 (41%)	9 (27%)
Yes	77 (59%)	24 (73%)
Marital status		
Married	49 (28%)	63 (60%)
Single	91 (51%)	36 (34%)
Divorced	30 (17%)	6 (6%)
Separated	4 (2%)	0 (0%)
Widowed	4 (2%)	0 (0%)
Ethnic group		
Indian born Jews	8 (4.5%)	3 (2.9%)
Israeli born Arabs	20 (11.2%)	15 (14.3%)
Israeli born Jews	95 (53.4%)	64 (61%)
North African born Jews	6 (3.4%)	3 (2.9%)
Former Soviet Union born Jews	18 (10.1%)	6 (5.7%)
Western born Jews	31 (17.4%)	14 (13.3%)
Years of education*		
< 12	56 (39%)	4 (12%)
≥ 12	87 (61%)	30 (88%)
Soldier status		
Yes	18 (10%)	12 (11%)
No	160 (90%)	93 (89%)
Homelessness		
Yes	9 (5%)	0 (0%)
No	169 (95%)	105 (100%)
CAGE		
0–1	138 (77.5%)	91 (87%)
2–4	40 (22.5%)	14 (13%)

*Data not available for all patients

Of the 178 patients referred for psychiatric consultation, 40 (22.5%) scored 2–4 on the CAGE; of the 105 non-psychiatric consultation patients, 14 (13.3%) scored 2–4 on the CAGE [Table 1]. The majority of patients from the psychiatric consultation group (72%) and from the non-psychiatric consultation group (65%) were seen in the ER [Table 2].

The two populations of patients – those referred for psychiatric consultation and those randomly selected – were merged on the basis of a lack of interaction between risk factors in the two groups. Since models 1 and 2 gave very similar results, only the model M1 results are presented here as multivariate analysis results.

On univariate analysis, AUD was associated with living alone ($P = 0.022$) and lower educational status ($P = 0.04$), and inversely associated with religious observance ($P = 0.03$). Divorced and separated patients had higher CAGE scores than married patients ($P = 0.001$).

Table 2. Clinical characteristics of studied patients

	Psychiatric consultation group (n=178)	Non-psychiatric group (n=105)
Hospital ward	128 (72%)	68 (65%)
Emergency room	20(11%)	21 (20%)
Internal medicine	14 (8%)	13 (12%)
Surgery	16 (9%)	3 (3%)
Other		
Diagnosis	66 (63%)	1 (1%)
Suicide attempt/threats	22 (12%)	0 (%)
Anxiety	7 (4%)	0 (0%)
PTSD	26 (15%)	1 (1%)
Depression	7 (4%)	0 (%)
Somatoform disorder	3 (2%)	2 (2%)
Eating disorder	22 (12%)	0 (0%)
Personality disorder	8 (5%)	0 (0%)
Bipolar disorder	20 (11%)	0 (0%)
Psychosis	30 (17%)	4 (4%)
Drug abuse	10 (6%)	45 (43%)
Pain	8 (5%)	21 (20%)
Infection	3 (2%)	14 (13%)
Trauma		
Cigarette use *	72 (51%)	11 (32%)

* Reduced patient sample

PTSD = post-traumatic stress disorder

Soldier status and CAGE scores 2–4 were not significantly associated, but there was a significant association on univariate analysis between soldier status of patients and CAGE scores 1–4 ($P = 0.01$) [Table 3].

Ethnic background and AUD were associated on univariate analysis ($P = 0.026$) [Table 3]. The significant finding was the high CAGE scores in patients born in the former Soviet Union ($P = 0.016$) [Table 3]. Cigarette smoking and drug use were associated with AUD on univariate and multivariate analysis (cigarette use univariate analysis $P = 0.0002$, multivariate analysis odds ratio 3.10, confidence interval 1.09–8.82, $P = 0.03$; drug abuse univariate analysis $P = 0.0006$, multivariate analysis OR 3.66, CI 1.20–11.18, $P = 0.02$) [Table 3]. Neither gender nor homelessness was related to AUD in our study [Table 3].

We did not find a significant association between AUD and patients referred for psychiatric consultation in comparison to the non-referred group ($P = 0.059$) [Table 4].

The only psychiatric diagnosis that was found to be statistically associated with AUD was post-traumatic stress disorder (PTSD): $P = 0.027$ on univariate analysis and $P = 0.03$ on multivariate analysis (OR 10.01, CI 1.18–84.95) [Table 4].

Documentation of alcohol consumption in the files of AUD patients was found in 19/40 (48%) of the psychiatric consultation group and in 3/14 (21%) of the non-psychiatric group. Documentation of alcohol use in the medical file was significantly associated with AUD on univariate analysis ($P = 0.0001$) and on multivariate analysis (OR 8.36, CI 2.72–25.6, $P = 0.0002$) [Table 4].

OR = odds ratio

CI = confidence interval

Table 3. Demographic characteristics of patients (N=283) according to CAGE

	CAGE 0–1 (n=229)	CAGE 2–4 (AUD) (n=54)	Univariate *P* value
Gender			NS (0.56)
Female	99 (43.2 %)	21 (38.9 %)	
Male	130 (56.8%)	33 (61.1%)	
≥ 61	21 (9.2%)	1 (1.8%)	
Age (yrs)	36.57±14.5	38.44±14.7	NS (0.39)
Religion			NS (0.46)
Jewish	122 (86.5%)	34 (89.4%)	
Muslim	15 (10.6%)	2 (5.3%)	
Christian	4 (2.8%)	2 (5.3%)	
Practising religion*			0.03
No	64 (48.9%)	22 (68.7%)	
Yes	67 (51.1%)	10 (31.2%)	
Marital status			‹0.001
Married	98 (42.8%)	14 (25.9%)	
Single	106 (46.3%)	21 (38.9%)	
Divorced	22 (9.6%)	14 (25.9%)	
Separated	0 (0.0%)	4 (7.4%)	
Widowed	3 (1.3%)	1 (1.8%)	
Ethnic groups			0.026
Former Soviet Union born Jews	15 (6.5%)	9 (16.7%)	
Indian born Jews	7 (3%)	4 (7.4%)	
Western born Jews	34 (14.8%)	11 (20.3%)	
Israeli born Jews	134 (58.5%)	25 (46.2%)	
Israeli born Arabs	31 (13.5%)	4 (7.4%)	
North African born Jews	8 (3.5%)	1 (1.8%)	
Years of education*			0.04
‹ 12	43 (30.3%)	17 (48.6%)	
≥ 12	99 (69.7%)	18 (51.4%)	
Soldier status			0.53
No	206 (89.9)%	47 (87%)	
Yes	23 (10%)	7 (12.9%)	
Homelessness			NS (0.07)
No	224 (97.8%)	50 (92.6%)	
Yes	5 (2.2%)	4 (7.4%)	

* Reduced patient sample

AUD = alcohol use disorder

Table 4. Clinical characteristics of patients (N=283) according to CAGE

	CAGE 0–1 n=229 (80.9%)	CAGE 2–4 n=54 (19.1%)	Univariate *P* value	Multivariate *P* value
Hospital ward			NS (0.77)	
Emergency room	158 (68.9%)	38 (70.4%)		
Internal Medicine	32 (13.9%)	9 (16.6%)		
Surgery	22 (9.6%)	5 (9.2%)		
Other	17 (7.4%)	2 (3.7%)		
Documentation of alcohol use in file			‹ 0.0001	0.0002
No	215 (93.8%)	32 (59.2%)		
Yes	14 (6.1%)	22 (40.7%)		
Group			NS (0.059)	
Psychiatric consult group	138 (60.3%)	40 (74.1%)		
Non-psychiatric group	91 (39.7%)	14 (25.9%)		
Diagnosis				
Suicide attempt/threats	52 (23.4%)	15 (24.6%)	0.48	
Anxiety	22 (9.9%)	0 (0%)	0.011	
PTSD	3 (1.3%)	4 (6.5%)	0.027	0.035
Depression	5 (2.2%)	1 (1.6%)	0.14	
Somatoform disorder	6 (2.7%)	1(1.6%)	1.0	
Eating disorder	4 (1.8%)	1(1.6%)	1.0	
Personality disorder	15 (6.7%)	7 (11.5%)	0.15	
Bipolar disorder	8 (3.6%)	0 (0%)	0.36	
Psychosis	11 (4.9%)	0 (0.0%)	0.07	
Drug abuse	7 (3.1%)	1 (1.6%)	0.07	
Pain	45 (20.3%)	10 (16.4%)		
Infection	25 (11.3%)	4 (6.54%)		
Trauma	15 (6.7%)	2 (3.2%)		
Drug abuse			0.0006	0.022
No	209 (91.3%)	40 (74.1%)		
Yes	20 (8.7%)	14 (25.9%)		
Cigarette use*			0.0002	0.034
No	84 (60%)	7 (20.6%)		
Yes	56 (40%)	27 (79.4%)		

* Reduced patient sample

AUD = Alcohol use disorder, PTSD = post-traumatic stress disorder

DISCUSSION

The prevalence rate of AUD in the non-psychiatric consultation group of patients in our study was less than rates of AUD in general hospitals in countries with more established drinking habits [8]. This is consistent with the finding that Israeli per capita alcohol consumption as of 2003 still ranked low by world standards (2.5 L per year for persons over the age of 15, the lowest ranking country being Egypt with 0.2 L, and Luxembourg with 15.6 L being the highest). However, in contrast to the documented fall in alcohol use per capita in Europe over the last 20 years [21], there has been an ongoing rise in the consumption of alcohol and illegal psychoactive drug use in Israel between 1989 and 2005 [22]. Of more concern, according to a recent poll by the Israel Anti-Drug Authority, Israel is rated second in Europe after the Ukraine for alcohol use among 11 year olds [23,24]. In Israel today there is an established culture of alcohol consumption, with the attendant alcohol-related violence and traffic accidents. Between 8% and 17% of driver fatalities in Israel have a blood alcohol concentration over the legal limit of 0.05 g/dl [6].

In our study, patients born in the former Soviet Union were at higher risk for AUD than Israeli patients. This phenomenon may be related to cultural factors associated with large quantities of alcohol consumption as well as genetic biochemical factors relating to alcohol metabolism [2].

There was a trend for Israeli born Muslims to demonstrate lower CAGE scores, possibly to due to their observance of Islamic laws, which prohibit alcohol. This trend is in keeping with the literature [24]. We confirmed the findings in the literature [15] that religious observance is inversely related to AUD.

In our study we found an association between a diagnosis of PTSD and AUD. Comorbid past sexual trauma, risk-taking behavior and problematic alcohol use in young women has been described in the literature [25]. However, a gender difference in AUD was not found in our study, in contrast to studies in general hospitals conducted outside of Israel [8] which found a higher rate of AUD in males. This discrepancy may relate to the small numbers in the study population.

We found a significant relationship between soldier status of patients and CAGE scores 1–4. Although we did not find

a significant relationship between soldier status and CAGE scores 2–4, it is of concern that a number of soldiers presented to our hospital with a history of inappropriate alcohol use.

Details of alcohol consumption were often not documented in the patients' hospital files, particularly in the non-psychiatric consultation group. Physicians in many specialties do not take complete histories, and relevant information may be left out. This finding of under-detection of AUD raises some worrisome questions that merit clarification: Israel is a country that prides itself on advances in medical practice, universal health care, and physicians who immigrated from many countries. The reason for under-diagnosis may relate to the fact that low rates of AUD were traditionally seen in Jews. In our experience of general hospital psychiatry, it is not uncommon that inpatients suffering from alcohol withdrawal syndromes including delirium tremens were initially diagnosed by the liaison psychiatrist. Our results reinforce the findings in the literature [8] that the diagnosis of problematic alcohol use in a general hospital is relatively low without the standardized use of screening instruments. Improving alcohol history taking by hospital doctors has been discussed elsewhere [9].

CONCLUSIONS

Although there was no statistical difference between the two groups of patients with regard to AUD, there could be a bias toward the consultation group with an over-representation of a population at risk for AUD. This is one of the limitations of the study. The prevalence rate of AUD in our study was relatively high. The changing drinking patterns in Israel together with the preliminary findings from our study that was conducted in the second largest hospital in Jerusalem, which serves a varied population that ethnically reflects Israeli population, support the notion that there is a possible developing AUD in Israel.

This study highlights the absence of documentation of alcohol consumption in the medical files in an Israeli hospital. Better history taking of patients' alcohol consumption would facilitate identification and treatment of high risk patients suffering from AUD. These facts have implications for medical training programs. Medical staff need to learn how to identify AUD in general hospital patients and should be acquainted with the sociocultural barriers that may prevent this identification. Special attention should be given to soldiers and to patients suffering from PTSD.

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