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Original Research Article

A Study on Alcohol Usage Profile among Urban Adults and its Correlation with Abnormal Liver Function

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Abstract: Alcohol consumption has been an accepted social practice since time immemorial. Alcohol, a drug, is consumed at some time by up to 80% of the population. The consumption of more than two standard drinks per day increases the risk for health problem in many organ systems. The objectives of the present study was to find out the alcohol usage profile among the adult alcohol users from Chidambaram town and the association between drinks per episode, episode per year, duration of diabetes mellitus and liver enzymes. The study was a descriptive cross-sectional study was carried out in the field practice area of Urban Health centre (UHC) under Community Medicine, Rajah Muthiah Medical College and Hospital (RMMCH), Chidambaram, Annamalai University between October 2015 and July 2016.Majority (78.43%) of the study subjects AST enzyme value of ≤40 units/ litre that shows within normal limit. Majority (83.00%) of the study subjects ALT enzyme value of ≤40 units/ litre and also in normal limit. Majority (88.88%) of the study subjects GGT enzyme value of ≤60 units/litre. Duration of being alcoholic, number of episodes per year and drinks per episode were influencing the liver enzyme values significantly. Candidates having increased liver enzymes also are potential candidates to have hepatic damage. Hence by decreasing the alcohol quantity and also interventions that aid in stopping alcohol would help in preventing hepatic damage.
Keywords: Alcohol consumption, health problem, diabetes mellitus, liver damage

INTRODUCTION

Alcohol consumption has been an accepted social practice since time immemorial. Alcohol, a drug, is consumed at some time by up to 80% of the population. At low dose alcohol has some beneficial effects such as decreased rates of myocardial infarction, stroke gallstones and possibly vascular and Alzheimer's dementias. However the consumption of more than two standard drinks per day increases the risk for health problem in many organ systems [1]. Over the past 30-40yrs worldwide alcohol consumption has increased in quantity and frequency and the age at which drinking starts has declined. WHO has estimated that about 2 billion people worldwide consume alcoholic beverages. India has an estimated 62.5 million alcohol users. A survey in India showed that around 20-30% of adult males and around 5% of adult females use alcohol. Over the period from 1970-1996 per-capita consumption of alcohol has increased by 106.7% [2].

The term 'alcoholism' means both Alcohol abuse and Alcohol dependence. It is one of the leading causes of death and disability globally and in India. Alcohol abuse is defined as repetitive problems with alcohol in any one of the four areas – Social, Inter-personal, Legal and Occupational – or repeated use in hazardous situation such as driving with intoxication [1]. Alcohol dependence is defined in DSM-IV as repeated alcohol related difficulties in at least three of seven areas of functioning that cluster together over a 12-month period. Two of these seven items, tolerance and withdrawal, may have special importance as they are associated with a more severe clinical course [1].

Alcohol dependence is seen in all countries where alcohol is available and occurs in men and women from all socio-economic strata and all racial backgrounds. The lifetime risk for alcohol dependence in most western countries is about 10-15% for men and 5-8% for women. Rates are generally similar in the USA, Canada, Germany, Australia and England. Rates tend to be lower in most Mediterranean countries such as Italy, Greece and Israel, and may be higher in Ireland, France and Scandinavian countries. Even higher rates have been reported for several native cultures including America-Indians, Eskimos, Maori groups, and aboriginal tribes of Australia. These differences reflect both cultural and genetic influences. When alcohol abuse is also considered, the rates of alcohol use disorders (AUD) increased. In western countries the typical does not fulfill the common stereotype of a 'skidrow denizen' but is more often a

blue or white collar workers or home makers. The lifetime risk for alcoholism among physicians is similar to that of general population [1].

A recent study highlighted that in India, health loss from alcohol will grow even larger unless effective interventions and policies are implemented to reduce these habits [3].

About 80% of alcohol consumption is in the form of hard liquor or distilled spirits showing that most the people who drink consume beverages with a high concentration of alcohol. Branded liquor accounts for about 40% of alcohol consumption while the rest is in the form of country liquor [4]. A study done in Hariyana state of India has revealed 66.3% of country liquor consumption compared to 29.% and 5% of IMFL(Indian manufactured Foreign Liquor – Beer, Brandy, Gin, Rum, Whisky) [5].

In India drinking heavily and frequently has become signature pattern among Indians which is of a serious health concern. Numbers of factors are associated at the individual and social levels to determine the magnitude and pattern of alcohol consumption and alcohol use disorders (AUDs) [6]. The relation between these factors and alcohol related problems seems to be complex.

The objectives of the present study was to find out the alcohol usage profile among the adult alcohol users from Chidambaram town and the association between drinks per episode, episode per year, duration of diabetes mellitus and liver enzymes.

MATERIALS AND METHODS

This was a descriptive cross-sectional study carried out in the field practice area of Urban Health centre (UHC) under Community Medicine, Rajah Muthiah Medical College and Hospital (RMMCH), Chidambaram, Annamalai University between October 2015 and July 2016. According to census 2011, Chidambaram, a municipality located in Cuddalore district of Tamilnadu., comprised of 33 wards and 146 streets with a population of 85,458. The service of the UHC is extended over four areas of Chidambaram municipality namely old bhuvanagiri, manthakarai, Omakkulam and Sengattan areas with a total of 23 streets comprising of 12,525 population.

Inclusion criteria

Adults aged 25yrs and above with history of consumption of alcohol at least once in the past one year (current users as per operational definition) were identified and those who were willing to take part in the interview.

Semi structured and pre-tested interview schedule was used to collect the required data. Convenient and purposive sampling was done. Investigator approached the adults aged minimum 25yrs who come to the alcoholic beverages selling outlets and drinking areas like licensed bars as well as other areas where the alcoholics gather in the town. Among the subjects met with those having history of consumption of alcohol at least once in the past one year (current users as per operational definition) were identified and included in the study. Totally 153 study participants were included into the study. The socio-demographic profile consisting of name, age, sex, religion, education, occupation, income, marital status along with address and contact number were recorded.

The respondent were questioned regarding the age of initiation, frequency, type of beverage preferred and the maximum and minimum number drinks per occasion, reason behind the start of alcoholism and whether the alcoholism serves the purpose the subject wanted. Venous blood was collected in a sterile manner then it was sent to the nearby laboratory for liver enzymes estimation.

Data Analysis

Collected data was entered in Microsoft 2013 excel spread sheet, compiled and analyzed for frequency distribution, correlation and ANOVA using IBM SPSS Version 21 statistical package.

RESULTS

This descriptive cross sectional study was conducted among 153 study participants. 60.13% of the study subjects were between 36-45 years. Majority (98%) of the study subjects were males. 34% do unskilled job. 34.70% of the study subjects earned monthly income above Rs 25,000(Table.1). Majority (71.90%) of the study subjects reason to start alcohol for joy. 36.60% of the study subjects drinks above hundred episodes for past one year. 52.3% of the study subjects had 6-9 drinks per episode. 44.44% of the study subjects started the drink at age of 26-35years. (Table.2) .The mean age at the start of alcohol consumption in this study population is 25.52 with a standard deviation of 7.2 years.

Majority (78.43%) of the study subjects AST enzyme value of ≤40 units/ litre that shows within normal limit. Majority (83.00%) of the study subjects ALT enzyme value of ≤40 units/ litre and also in normal limit. Majority (88.88%) of the study subjects GGT enzyme value of ≤60 units/litre. (Table.3)

Table-1: Socio-demographic characteristics of the study participants

Variables Age at years	Frequency (N)	Percentage (%)
26-35	22	14.38%
36-45	92	60.13%
46-55	32	20.92%
56-65	07	04.57%
Sex	Frequency	Percentage
Male	150	98%
Female	003	02%
Occupation	Frequency	Percentage
Un skilled	52	34.00%
Semi-skilled	09	05.90%
Skilled	30	19.60%
Clerical/shop/farmers	51	33.30%
Semi professional	02	01.30%
Professional	09	05.90%
Income (monthly)	Frequency	Percentage
<3000	01	00.70%
3001-5000	O2	01.30%
5001-10000	23	15.00%
10001-15000	47	30.70%
15001-25000	27	17.60%
>25000	53	34.70%
Total	153	100%

Table-2: Distribution of drinking pattern among the alcoholics

Episode for past 1 year	Frequency (n)	Percentage (%)
1	02	01.30%
2-10	11	07.20%
11-30	30	19.60%
31-60	34	22.20%
61-100	20	13.10%
>100	56	36.60%
Quantity	Frequency (n)	Percentage (%)
1-2	22	14.40%
3-5	17	11.10%
6-9	80	52.30%
>9	34	22.20%
Age at which alcoholics had started to drink.	Frequency (n)	Percentage (%)
6-15	13	8.5
16-25	68	44.44
26-35	59	38.56
36-45	13	8.5

Table-3: Distribution of study subjects according to Liver Function Test enzyme values.

AST		
Enzyme values (u/l)	Frequency	Percentage
≤40	120	78.43%
>40	033	21.57%
Total	153	100%
ALT		
Enzyme values (u/l)	Frequency	Percentage
≤40	127	83.00%
>40	026	17.00%
Total	153	100%
GGT		
Enzyme values (u/l)	Frequency	Percentage
≤60	136	88.88%
>60	017	11.12%
Total	153	100%

Table-4: Difference in mean AST, ALT and GGT and drinking pattern

Liver enzymes	Variables	Mean	Standard deviation	ANOVA F-value	P-value	LSD multiple comparison test result
Drinks per episode						
AST	1-2	27.68	10.74	4.226	<0.05*	1-2 times, 3-5 times, 6-9 times < more than 9 times.
	3-5	27.24	7.63			
	6-9	30.74	13.28			
	>9	39.65	22.63			
ALT	1-2	33.36	14.60	2.211	>0.05	----------
	3-5	27.88	7.20			
	6-9	30.94	9.31			
	>9	36.74	20.73			
GGT	1-2	25.00	10.86	5.949	<0.05*	1-2 times, 3-5 times, 6-9 times < more than 9 times.
	3-5	19.82	7.10			
	6-9	34.70	23.69			
	>9	64.91	85.80			
Episodes per year						
AST	1-30	27.19	9.816	5.308	<0.05*	1-30times, 31-100 times < above 100times
	30-100	30.46	13.73			
	>100	36.88	19.36			
ALT	1-30	32.05	10.76	0.706	>0.05	---
	30-100	30.76	10.57			
	>100	33.80	17.31			
GGT	1-30	24.30	11.36	9.942	<0.05*	1-30times, 31-100 times < above 100times
	30-100	28.13	15.55			
	>100	59.04	69.94			
Duration of being alcoholic (years)						
AST	< 10	29.50	11.11	0.789	>0.05	----------
	10-20	32.17	16.78			
	>20	33.94	17.31			
ALT	< 10	32.93	11.00	0.131	>0.05	----------
	10-20	31.69	12.28			
	> 20	32.64	17.97			
GGT	< 10	33.60	25.27	0.438	>0.05	----------
	10-20	38.40	44.36			
	> 20	43.58	65.24			

* indicates significant association.

The duration of alcoholic was classified into three categories as less than 10years, 10 to 20 years and more than 20 years. No significant differences were found between mean levels of AST, ALT, GGT and the duration of being alcoholic. The drinks per episode were classified into four categories as 1-2 drinks per episode, 3-5 drinks per episode, 6-9 drinks per episode and more than 9 drinks per episode. The mean AST values for each category were 27.68 U/L, 27.24 U/L, 30.74 U/L and 39.74 U/L, respectively. The mean GGT level was 25 U/L, 19.82 U/L, 34.70 U/L and 64.91 U/L, respectively. By applying one way anova, the mean AST values and GGT values between each group was found to have significant difference ($P<0.05$). By applying LSD multiple comparisons test the study participants more than 9 times had significantly increased values of AST and GGT than those who were drinking less than 9 times (Table.4).

The number of episodes of drinking per year has been classified into three categories, as <30 times per year, 31-100 times per year and more than 100 times/year. The average AST level was found to be 27Units/l, 30.4 Units/l, 36.8Units /l, respectively for the above three categories. As the number of episodes of drinking level increases, the mean AST level also increases. In case of GGT the mean values for the three groups < 30 times per year, 31-100 times per year and >100 times per year was 24.30 Units/L, 28.13 Units/L and 59.04 Units/L, respectively. As the number of episodes of drink increases, the mean GGT value also increases. To verify the above findings one way anova test has been applied to both AST and GGT levels. The significant p-value indicates that the above three mean values of AST and GGT were statistically different. To find out which of the categories are statistically different LSD multiple comparison test has been applied. The result indicates category three has higher AST level than the other two categories. Similarly GGT level of category three is higher than the remaining two categories (Table.4).

DISCUSSION

Alcoholism is one of the major public health problems in both developed and developing countries [7]. It is influenced by the combined effects of globalization, market forces, changing government policies, media promotion and also changing values of Indian society. The 32nd World Health Assembly declared that "problems related to alcohol and particularly to its excessive consumption rank among the world's major public health problems and constitute serious hazards for human health, welfare and life" [5]. A large proportion of current alcohol users have hazardous or probably dependent patterns of alcohol us [8].

44.44% of the study subjects started the drink at age of 26-35years.The mean age at the start of alcohol consumption in this study population is 25.52±7.2 years. This result is comparable to the study results that the mean age of the consumers at the initiation of consuming alcoholic beverages was 20.5±5.7 years, which is considerably low [9]. Overall, the age range at initiation of drinking was 20-29 years as found in different studies, despite the wide differences among regions, populations, and years of studies [9-13].

No significant difference was found between mean levels of AST, ALT, GGT and the duration of being alcoholic. By applying one way anova, the mean AST values and GGT values between each group was found to have significant difference ($P<0.05$). By applying LSD multiple comparisons test the study participants more than 9 times had significantly increased values of AST and GGT than those who were drinking less than 9 times. In this study it could be found that as the number of episodes of drinking per year level increases, the mean AST level and the mean GGT value increases. One way ANOVA test has been applied to both AST and GGT levels. The significant p-value indicates that the both mean values of AST and GGT were statistically different.

To find out which of the categories are statistically different LSD multiple comparison test has been applied. The result indicates category three (i.e. >100 drinking episodes per year) has higher AST level than the other two categories. Similarly GGT level of category three is higher than the remaining two categories. According to Limdi et al. [14] a biochemical clue is the ratio of AST to ALT (2:1 at least),reflecting the low level of activity of ALT in people with alcoholic and a gammaglutamyl transferase level of twice the normal with an AST/ALT ratio of 2:1 or more is highly suggestive of alcohol abuse. As the study population was from the urban field practice area and convenient sampling was done. The result cannot be generalized. Only self-reported alcohol consumption has been taken into account. Recall bias can be present in the study as many variables like duration of being alcoholic were limitations of the study.

CONCLUSION

Factors like duration of alcoholic, number of episodes per year and drinks per episode were influencing the liver enzyme values significantly. Candidates having increased liver enzymes also are potential candidates to have hepatic damage. Hence by decreasing the alcohol quantity and also interventions that aid in stopping alcohol would help in preventing hepatic damage.

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