

Sexual dysfunction in male patients with alcohol dependence syndrome – A case-control study

Pavan Kumar Kadiyala

Assistant Professor, Dept. of Psychiatry, ASR Academy of Medical Sciences, Eluru, Andhra Pradesh, India

*Corresponding Author: Pavan Kumar Kadiyala

Email: drkadiyala2@gmail.com

Abstract

Introduction and Aim: Alcohol may foster the initiation of sexual activity by removing inhibitions, but it impairs performance in the long-run, which leads to marked discomfort and relationship problems. These problems, in turn, would amplify alcohol misuse. Some studies have looked into sexual dysfunction due to alcohol, but there are only a few case-control studies reported from India.

Materials and Methods: 100 married male patients with alcohol dependence and 50 controls were evaluated. All study subjects were assessed for the socio-demographic profile and alcohol-related variables using semi-structured intake proforma, ICD 10, ICD 10 AM symptom checklist, and sexual.

Dysfunction checklist. Cochran-Mantel-Haenzel test and unconditional logistic regression were used for analysis.

Results: The two groups differed significantly with regard to age, domicile, family type, religion, nicotine use, and family history of alcohol use. 26% of patients had sexual dysfunction compared to 10% in controls with an odds ratio (OR) of 3.16 (CI: 1.13 -8.83). The difference almost reached statistical significance after controlling the confounding variables, age ($p=0.06$; common OR estimate=3.09), and co-morbid nicotine use ($p=0.002$; common OR estimate=5.37). About half of the patients with sexual dysfunction had it on more than one domain. Loss of desire was the prominent dysfunction in patients, while premature ejaculation was leading in controls. All those patients with chronic liver disease had sexual dysfunction.

Conclusion: The study highlights the global nature of sexual dysfunction in men with alcohol dependence. It emphasizes the need for clinicians to routinely assess the sexual problems in their alcohol drinking patients, especially those with liver disease.

Keywords: Alcohol Dependence, Sexual dysfunction, Alcohol, Sex.

Introduction

Alcohol surrounds us. It became the most popular drug of abuse in the 21st century.¹ Sexual dysfunction (SD) is quite common in the general population, with one in five males suffering from it.² Alcohol is long regarded as a risk factor for SD, whether in textbooks, review articles, or clinical teachings.³ The rates of SD in the alcohol-dependent population extend between 8 and 95.2%. The typical SDs reported have been erectile dysfunction followed by premature ejaculation, delayed ejaculation, and decreased sexual desire.⁴ However, it appears alcohol consumption is related to sexual function in a J-shape manner, with moderate consumption conferring the highest protection and higher use conferring fewer benefits. Chronic cytotoxic effects of alcohol on general health, endocrine, and hepatic function might be a mediator between the association of high alcohol consumption and SD.³ Advancing age, education level, unemployment, and cigarette use may be the other correlates of SD in men with alcohol dependence.⁴

There is a limited number of studies that have evaluated the SD in patients with alcohol dependence. There are only a few studies reported from India. A cross-sectional study by Benegal and Arackal at NIMHANS, Karnataka, South India using sexual dysfunction checklist found that 72% of men with alcohol dependence had one or more sexual dysfunctions, most common being premature ejaculation, low sexual desire and erectile dysfunction.⁵ SD was present in 37% of the study population in a similar study using Arizona Sexual Experience Scale (ASEX) in Kerala, another state in South India.⁶ These studies are limited by lack of controls, and having a non-drinking control sample, would

lend a greater depth of the above findings. A case-control study from north India reported the presence of ASEX defined overall sexual dysfunction in 59% of men with alcohol dependence. The dysfunction varied among different domains, with prevalence rates between 35-58%, which were significantly higher than those seen in the control group except for the domain of ejaculation/ability to reach orgasm.⁷ Hence, this study was planned to assess sexual dysfunction in patients with alcohol dependence in comparison with controls.

Objectives of the Study

1. To study the frequency and nature of SDs in men with alcohol dependence syndrome (ADS) compared to healthy controls.
2. To study the relationship of SDs to socio-demographic and clinical variables in men with alcohol dependence.

Materials and Methods

Source of data

This non-matched cross-sectional, case-control study was conducted in the de-addiction centre of the department of psychiatry in Father Muller Medical College, Mangalore, a south-Indian city in the year 2013. The study sample consisted of two groups, recruited through convenience sampling: 100 in-patients with an ICD-10 (International Statistical Classification of Diseases and Related Health Problems, Tenth Revision) diagnosis of alcohol dependence and 50 controls enrolled from medical wards admitted for management of transient febrile illness. The study was approved by the institutional ethics board.

Inclusion criteria

1. Married men (currently having a stable heterosexual sexual partner.)
2. Age: 25 - 60 years.

Exclusion criteria

1. A history of primary sexual dysfunction.
2. Co-morbid physical or psychiatric disorder/s or on medications that can potentially cause SD.
3. Dependence on substance/s other than alcohol except for tobacco.

Tools used in the study

1. ICD 10 for the diagnosis of ADS⁸
2. ICD 10 AM Symptom Checklist and Modules⁹
3. Intake Proforma: A specific proforma designed for the study to evaluate socio-demographic, and alcohol-related variables (age of initiation, onset and duration of dependence, amount and preferred drink, complications, nicotine use and family history of alcohol use)
4. Sexual Dysfunction Checklist: The checklist is used to find out the presence and the type of sexual dysfunction. It contains items corresponding to 12 areas of sexual dysfunction described in the Diagnostic Criteria for Research, ICD-10 Classification of Mental and Behavioural Disorders.^{5,8}

Procedure

After explaining the purpose and design of the study, written informed consent was obtained for participation from all the patients and controls recruited for the study. The socio-demographic and clinical variables were recorded in a specific form prepared for the clinical study. All the patients and controls were asked for a complete treatment history. They underwent a thorough clinical examination and blood investigations to rule out any medical disorders that can impair sexual functioning. They were further administered the ICD-10-AM (International Statistical Classification of Diseases and Related Health Problems, Tenth Revision, Australian Modification (ICD-10-AM) Symptom Checklist for mental disorders screener by a trained clinician. Those who required further examination were administered the appropriate modules of the ICD-10-AM to rule out psychiatric disorders that can impair sexual functioning. If any control found to have alcohol dependence while assessment, he was enrolled as a case to avoid selection bias. Sexual dysfunction checklist was administered on the patients, during the 3rd week of admission when their withdrawal symptoms got completely subsided. The controls were assessed for the same during their discharge.

Statistics

The results were analysed using SPSS version 25. Data were analysed in the form of mean and standard deviation for the continuous variables and frequency and percentage for the categorical variables. Pearson's chi-square test or Fisher's exact test were used to comparing categorical variables between cases and controls. Cochran-Mantel-Haenszel test

was used for controlling confounding (unmatched) variables. Unconditional logistic regression analysis was done to assess the predictors of sexual dysfunction among socio-demographic and alcohol-related variables. Statistical significance was assumed at a p-value <0.05.

Results

Men with alcohol dependence were different from controls with regard to socio-demographic data of age, domicile, religion, and family type. They were older than controls. The majority of the controls were from rural, joint, Islamic families compared to cases. There were no differences between them in education, occupation, and socio-economic status (SES). (Table 1)

76% of the patients in the case group initiated drinking alcohol before 25 years of age, with 31% of them started before 18 years of age. However, only 7% developed dependence before 25 years of age. The duration of dependence exceeded five years in 44% of patients by the time of de-addiction. The quantity of alcohol consumed per day was 14.9 (\pm 7.33) standard drinks (6-48 drinks per day). The predominant brand used was whisky (77%). More than half (54%) of the patients had alcoholic liver disease. Ultrasound was done in 27 patients who can afford it. Most of them (19) had fatty hepatomegaly. Eight had chronic liver disease (including cirrhosis). 67% of patients were having nicotine use compared to 26% in controls with significant difference ($p=0.00$). 3/4th of the patients in the case group had a family history of alcohol use, with half of them amounting to dependence. This finding was also significantly different from controls ($p<0.03$). (Tables 2 & 3)

46% of men with alcohol dependence had SD, whether situational or global. On ignoring temporary or situational complaints, 26% had SD. 10% of controls had global SD. The difference was statistically significant, with an odds ratio of 3.16 (95% CI of 1.13 – 8.83). Common odds ratio estimates using the Cochran-Mantel-Haenszel (CMH) test adjusted for age and nicotine use were estimated. The OR adjusted for age was 3.54 (95% CI of 1.06-9.00; Cochran's statistic = 0.033; Mantel-Haenszel statistic = 0.06) and that adjusted for nicotine use was 5.37 (95% CI of 1.78 – 16.16; Mantel-Haenszel statistic = 0.002). (Table 4)

Data on alcohol-related variables were compared between those with and without SD for comparison. 38% of those with SD exceeded ten years of dependence compared to 16% in those without SD. Two-thirds of those with SD had the complication of liver disease, while only half of those without SD had it. And 7 of 8 patients with chronic liver disease (including cirrhosis) had global SD (the remaining one had situational SD). Nicotine use was more common among those without SD than with SD. Differences were noted with regards to age (44.23 ± 8.88 vs. 41.82 ± 8.68 years) and duration of alcohol dependence (8.15 ± 8.51 vs. 6.15 ± 5.94 years) between those with and without nicotine use. (Table 2)

The prominent SD among men with alcohol dependence was low desire followed by premature ejaculation. Low sexual desire was reported by 14% and premature ejaculation by 11%. Every aspect of sexual functioning was disturbed in

men with alcohol dependence. 12% reported more than one sexual dysfunction. Premature ejaculation was a prominent type of dysfunction among controls. On the comparison between the patient and control groups, there was a significant difference with regards to low desire (p=0.02; OR- 7.98; 95% CI:1. 02-62.52) Frequency of intercourse

dissatisfaction approached marginally outside the level of significance (p= 0.096). (Table 5)

Unconditional logistic regression analysis was done to assess the predictors of sexual dysfunction among socio-demographic and clinical variables. None of the variables added significantly to the prediction.

Table 1: Comparison of Socio-demographic data between cases and controls

Socio-demographic variables		Cases (N=100)	Controls (N=50)	Chi-Square test
Age	25 - 30 years	9	11	P<0.02
	31 – 40	35	23	
	41 – 50	36	11	
	50 - 60 years	20	5	
Religion	Hindu	74	28	P<0.00
	Muslim	4	13	
	Christian	22	9	
Education	Illiterate	4	5	NS
	Up to 10 th grade	81	42	
	Above 10 th grade	15	3	
Occupation	Unemployed	1	0	NS
	Unskilled	45	28	
	Skilled	26	16	
	Farm owners	25	6	
	Professional	3	0	
Income (per month)	<7,500	39	21	NS
	7,500-15,000	34	11	
	>15,000	27	18	
Domicile	Urban	31	5	P<0.005
	Rural	69	45	
Family	Nuclear	58	20	P<0.05
	Joint	42	30	
Socioeconomic Status (SES)	Upper	20	8	NS
	Middle	38	18	
	Lower	42	24	

Table 2: Clinical variables of men with alcohol dependence.

Cases with Alcohol Dependence (N=100)				
Clinical variables		With Sexual Dysfunction (N= 26)	Without Sexual Dysfunction (N=74)	Total
Age of initiation of alcohol use	< 18 years	7 (27%)	24 (32%)	31
	18 - 24 years	12 (46%)	33 (45%)	45
	≥25 years	7 (27%)	17 (23%)	24
Age of onset of regular use	< 18 years	2 (08%)	3 (04%)	05
	18 - 24 years	4 (15%)	14 (19%)	18
	25 - 34 years	16 (62%)	41 (55%)	57
	≥ 35 years	4 (15%)	16 (22%)	20
Age of onset of dependence	< 25 years	2 (08%)	5 (07%)	07
	> 25 years	24 (92%)	69 (93%)	93
Duration of dependence	≤ 1 year	4 (15%)	5 (7%)	09
	1 - 5 years	10 (39%)	37 (50%)	47
	6 - 10 years	5 (19%)	20 (27%)	25
	>10years	7 (27%)	12 (16%)	19
Quantity (SD)	6 - 10	9 (35%)	22 (30%)	31
	11 - 15	6 (23%)	18 (24%)	24
	16 – 20	6 (23%)	20 (27%)	26
	>20	5 (19%)	14 (19%)	19

Drink type	Hard drinks (Brandy, Whisky, Rum, Vodka)	26 (100%)	73 (99%)	99
	Beer	0	1 (1%)	01
Nicotine use	Use	10 (38%)	57 (77%)	67
	Absent	16 (62%)	17 (23%)	33
Complications of alcohol	Liver Disease [Cirrhosis]	17 (65%) [07]	37 (50%) [01]	54 [08]
	Others	5 (19%)	14 (19%)	19
	None	4 (16%)	23 (31%)	27
Family history of Alcohol Use	Dependence	11 (42%)	28 (38%)	39
	Use	7 (27%)	29 (39%)	36
	Absent	8 (31%)	17 (23%)	25
Family history of Psychiatric disorders		2 (08%)	4 (05%)	06
Family history of Medical illness		16 (62%)	42 (57%)	58

Table 3: Comparison of clinical variables between cases and controls

Clinical Variables		Cases (N=100)	Controls (N=50)	Significance on Chi-Square/Fisher's Exact test
Nicotine use	Use	67	13 (26%)	22.5, p=0.000
	Absent	33	37 (74%)	
Family history of Alcohol Use	Dependence	39	15 (30%)	6.84, P<0.03
	Use	36	12 (24%)	
	Absent	25	23 (46%)	
Family history of Psychiatric disorders		6	0	P<0.08
Family history of Medical illness		58	21 (42%)	3.42 P<0.06

Table 4: Comparison of sexual dysfunction between cases and controls

Sexual Dysfunction		Chi Square test	Odds Ratio	95% Confidence Interval	
Cases (N=100)	Controls (N=50)			Lower	Upper
26	5	5.20, p=0.023	3.16	1.13	8.83
CMH test adjusted for age		3.54, p=0.06	3.09	1.062	9.003
CMH test adjusted for nicotine use		9.56, p=0.002	5.37	1.784	16.163

Table 5: Comparison of domains of sexual dysfunction checklist between cases and controls

Sexual Dysfunction Checklist	Global		Significance Chi-Square/ Fisher's Exact test (p value)	Odds Ratio	95% Confidence Interval	
	Cases (N= 100)	Controls (N=50)			Lower	Upper
Low sexual desire	14	1	0.02	7.98	1.02	62.52
Difficulty achieving erection	3	1	1	1.52	0.15	14.95
Difficulty maintaining erection	5	1	0.66	2.58	0.29	22.69
Premature ejaculation	11	3	0.39	1.94	0.52	7.28
Delayed/ Inhibited ejaculation	5	0	0.16	-	-	-
Orgasm with flaccid penis	0	0	-	-	-	-
Anorgasmia	1	1	1	0.50	0.03	8.08
Pain coitus	0	0	-	-	-	-
Dissatisfaction with frequency of intercourse	7	0	0.096	-	-	-
Dissatisfaction of sexual relation with partner	2	0	0.55	-	-	-
Dissatisfaction with own sexual function	5	0	0.17	-	-	-

Table 6: Predictors of sexual dysfunction among socio-demographic and clinical variables

Socio-demographic and Clinical variables	Logistic regression analysis	
	Exp (B) value	P-value
Age in years	1.016	0.606
Duration of dependence	1.030	0.464
Amount of drinks	0.999	0.977
Alcoholic liver disease	1.783	0.229

Dependent variable: Global presence or absence sexual dysfunction on checklist

Discussion

In this study, the exclusive focus on males with alcoholism is entailed by the fact that the frequency of alcohol use by females in India, and concurrent alcohol dependence is exceedingly low.⁵ Co-morbid nicotine use is not excluded in the present study as it is widely prevalent in most of the patients with alcohol dependence.¹⁰ The socio-demographic profile of the sample is similar to previous studies done in the same region.^{11,12} Controls are drawn from the hospital population; however, they are not matched with regard to the number or characteristics of the cases. There is a significant difference between the two groups with regards to age, domicile, religion, and family type. The majority of the men in the case group belong to the 4th and 5th decades (mean 42.44 ±8.82), while most of the controls are in their 4th decade. 70% of patients with alcohol dependence belong to the rural area. Therefore drug abuse in India as an exclusively urban phenomenon is a myth as told by a National survey on the extent, pattern, and trends of drug abuse in India.¹³ Muslims are predominant in the control group rather than the case group, maybe because of religious restrictions in substance use.¹⁴

About three-fourths of the patients in the case group have started alcohol use before 25 years, with nearly one-third before 18 years. Though they started early, only 7% developed dependence patterns before 25 years. Thus, the majority (more than 90%) has Clolinger type 1 (milieu limited) alcohol dependence, which means the addiction is less hereditary and more influenced by the environment.¹⁵ These findings are similar to study in Bangalore, which showed the mean age of onset of initiation was 21.39±5.34 years, and the mean age of onset of dependence was 27.8±5.7 years.¹² The mean quantity of alcohol consumption per day is 14.74 (±7.22) standard units of drinks per day and preferred drink being whisky. The amount is smaller compared to other studies from the same region (20.6 ± 9.07 units in Bangalore's study and 21.23 ± 10.10 units in Kerala's study).^{5,6} Also the majority of patients in our study are referred for de-addiction in early years of dependence compared to other studies.^{5,7}

Three-fourths of patients have health complications being predominantly liver diseases and gastritis. These findings are similar to the WHO study in Bangalore. It states that the alcohol-users are found to be at approximately three times the risk of suffering from a health problem as compared to non-users.¹⁶ Nicotine use is also prominent among men with alcohol dependence which is a consistent finding in other studies.^{5,7}

A significant difference exists between men with and without alcohol dependence concerning nicotine use and family history of alcohol use. This difference signifies nicotine use and family history of alcohol are widely prevalent in most of the men with alcohol dependence.^{6,7} The deficiency of matching between cases and controls had been overcome by statistical analysis using Cochran-Mantel-Haenszel test which controlled confounding variables like age and nicotine use. Thus, the difference in SD between cases and controls wasn't due to these factors.

26% of men with alcohol dependence complain of one or more problems with sexual functioning. This finding is similar to results reported in earlier studies. The rates of SD in these studies have ranged 8-95.2%.⁴ SD was present in 37% of the study population (with a mean age of 39years) in another study using the ASEX scale in South India. The difference may be due to an increased quantity of alcohol taken, i.e., about 21 standard units per day compared to 15 units in our study.⁶ 72% of the sample reported dysfunction in multiple sexual domains in the previous study using the same scale of our research. The high prevalence of SD may be due to more quantity (20.6SD per day) and longer duration of 8.6years, though the mean age of the sample is less (37years) compared to our study.⁵ Another study from north India reported 58% sexual dysfunction in a population sample with a mean age of 37years drinking 17SD of alcohol per day for an average duration of 8.7years.⁷

The most common SD reported by men with alcohol dependence in our study is low sexual desire followed by premature ejaculation. Different types of SDs were reported as the commonest in men with alcohol dependence in the earlier studies. They include erectile dysfunction, premature ejaculation, delayed ejaculation, and decreased sexual desire.³ Studies each by Akhtar, Jensen, and Vijayasenan reported low sexual desire as the most frequent problem similar to our study.¹⁷⁻¹⁹ The finding is further confirmed in our research when men with alcohol dependence having SD compared with healthy controls on each domain of sexual dysfunction. Low sexual desire is significantly prominent in men with alcohol dependence.

Various co-existing dysfunctions are seen in the case sample. Therefore the number of SD complaints on the sexual dysfunction checklist is counted. The number of complaints is significantly higher than controls, indicating alcohol induces dysfunctions in multiple sexual domains. These findings are similar to previous studies.^{5,18,20}

Many previous studies assessed SD in correlation with age, age of onset of alcohol use, duration of alcohol dependence, presence of liver disease, nicotine use, level of

education, and unemployment.⁴ They showed conflicting results. A review published in 1991 concluded that in males with alcoholism, the higher quantity, frequency, and duration of drinking are associated with erectile dysfunction (ED), decreased libido, and delayed ejaculation.²¹ However, recent studies refute the link between SD and alcohol.⁴ A study by Okulate et al. in 2003 hadn't reported an increase in the risk of ED with alcohol abuse.²² A meta-analysis by Cheng et al. said that cross-sectional studies yielded a protective association of alcohol on ED, but cohort studies did not demonstrate any significant findings.³ None of the socio-demographic or alcohol-related variables added significantly to the prediction of sexual dysfunction in our study. In the study by Benegal and Arackal with the same scale of assessment used in our study, number of sexual dysfunction complaints was significantly associated with the amount of alcohol consumed per day, but not with number of years of alcohol dependence or on the age of the subject.⁵ Sexual dysfunction was significantly associated with the amount of alcohol consumed per day, and the duration and severity of alcohol dependence in the Kerala's study.⁶ The absence of association between SD and assessed alcohol-related variables in our study may be the result of confounding variables that weren't assessed in the patients with alcohol dependence.

All the patients with chronic liver disease (including cirrhosis) have SD, whether global or situational. This finding may be a result of an abnormality of the physiology of the hypothalamic-pituitary-gonadal-axis.²³ Patients without sexual dysfunction have increased frequency of nicotine use than with SD in our sample. This finding may be because of lower age and less severity on other alcohol-related variables among those who use nicotine. Further, standardized scales for assessing nicotine use are not used in our study.

The present study is one of the few case-control studies comparing sexual dysfunction in alcohol dependence with controls. It excluded confounding variables like the use of other substances except for nicotine, comorbidities, and co-administered medications. It also assessed the correlation of sexual dysfunction with alcohol-related variables.

Limitations of the study are

1. Being a cross-sectional done on admitted patients in a tertiary care hospital limits the generalization of the findings.
2. Only male and married patients are included in the present study
3. Nicotine use is not excluded from the study.
4. Data on nocturnal erection and hormonal levels are not assessed ruling out psychogenic sexual dysfunction.
5. Marital functioning is not explicitly evaluated, which is common in men with alcohol abuse.
6. Not assessed the severity of different aspects of sexual dysfunction caused by alcohol.

Conclusion

This study is one of the few case-control studies that examined the sexual dysfunction in alcohol dependence. It emphasizes the need for clinicians to routinely assess the risk of sexual problems, which is often missed, unexplored, however, very important for the management of addiction to alcohol.

Conflict of interest

Nil

Funding

Nil

Acknowledgment

I sincerely thank Dr. Denzil A Pinto and Dr. P John Mathai, my professors, for guiding me in doing this research.

References

1. Introduction: The History of Drug Abuse. In: The Encyclopedia of Drug Abuse. (Ed) Gwinnell E, Adamec C. Facts on File, Inc: West Street, New York; 2008.
2. Sathyanarayana Rao TS, Darshan MS, Tandon A. An epidemiological study of sexual disorders in south Indian rural population. *Indian J Psychiatry* 2015;57(2):150-7.
3. Cheng JY, Ng EM, Chen RY, Ko JS. Alcohol consumption and erectile dysfunction: meta-analysis of population-based studies. *Int J Impot Res* 2007;19(4):343-52.
4. Grover S, Mattoo SK, Pendharkar S, Kandappan V. Sexual Dysfunction in Patients with Alcohol and Opioid Dependence. *Indian J Psychol Med* 2014;36(4):355-65.
5. Benegal V, Arackal BS, Prevalence of sexual dysfunction in male subjects with alcohol dependence. *Indian J Psychiatry* 2007;49(2):109-12.
6. Prabhakaran DK, Nisha A, Varghese PJ. Prevalence and correlates of sexual dysfunction in male patients with alcohol dependence syndrome: A cross-sectional study. *Indian J Psychiatry* 2018;60:71-7.
7. Pendharkar S, Mattoo SK, Grover S. Sexual dysfunctions in alcohol-dependent men: A study from north India. *Indian J Med Res* 2016;144(3):393-9.
8. The International Classification of Diseases, tenth revision, Classification of Mental and Behavioural Disorders. World Health Organization. Geneva.1992.
9. National Centre for Classification in Health. The international statistical classification of diseases and related health problems, 10th revision, Australian modification (ICD-10-AM). Sydney: National Centre for Classification in Health, Faculty of Health Sciences, University of Sydney, 1998.
10. Gulliver SB, Rohsenow DJ, Colby SM. Interrelationship of smoking and alcohol dependence, use and urges to use. *J Stud Alcohol* 1995;56:202-6.
11. Kumar N, Kanchan T, Unnikrishnan B, Thapar R, Mithra P. Profile of Substance Use among Patients Attending De-Addiction Centres in a Coastal City of Southern India. *PLoS ONE* 2013;8(2):e57824.
12. Johnson PR, Banu S, Ashok MV. Severity of alcoholism in Indian males: Correlation with age of onset and family history of alcoholism. *Indian J Psychiatry* 2010;52(3):243-9.
13. Ray R, editor. Ministry of Social Justice and Empowerment, Government of India and United Nations Office on Drugs and Crime. The extent, pattern and trends of drug abuse in India-National survey. 2004.

14. Amy Adamczyk. The Indirect Result of Religious norms and Practices: Explaining Islam's Role in Limiting the Spread of HIV/AIDS. Religion and Social Problems. (Ed) Titus Hjelm. Taylor and Francis: New York, USA. 2011; 18-19.
15. Cloninger C. R., Bohman M., Sigvardsson S. Inheritance of alcohol abuse. Crossfostering analysis of adopted men. *Arch Gen Psychiat* 1981;38:861-8.
16. World Health Organization. Burden and socio-economic impact of alcohol, the Bangalore study. WHO: Regional Office for South-East Asia, New Delhi.
17. Akhtar JJ. Sexual Disorders in Male Alcoholics. In: Alcoholism and drug dependence: A multidisciplinary approach. (Ed) Madden JS, Walker R and Kenyon WH. Plenum Press: New York; 1977;3-12.
18. Jensen SB. Sexual customs and dysfunction in alcoholics. *Br J Sex Med* 1979;6:30-4.
19. Vijayasenana ME. Alcohol and sex. *N Z Med J* 1981;93:18-20.
20. Grinshpoon A, Margolis A, Weizman and its effect on A, Ponizovsky AM. Sildenafil citrate in the treatment of sexual dysfunction quality of life in alcohol dependent men: preliminary findings. *Alcohol Alcoholism* 2007;42(4):340-6.
21. Rosen RC. Alcohol and drug effects on sexual response: Human experimental and clinical studies. *Annu Rev Sex Res* 1991;2:119-79.
22. Okulate G, Olayinka O, Dogunro AS. Erectile dysfunction: Prevalence and relationship to depression, alcohol abuse and panic disorder. *Gen Hosp Psychiatry* 2003;25:209-13.
23. Burra P, Germani G, Masier A, De Martin E, Gambato M, Salonia A et.al. Sexual dysfunction in chronic liver disease: is liver transplantation an effective cure?. *Transplant* 2010;89(12):1425-9.