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Sleep Disturbances in Patients With Alcohol Dependence Attending Psychiatry Outpatient Department at a Tertiary Care Hospital: A Cross-sectional Study

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Abstract

Alcohol consumption has become a topic of concern worldwide from a public health point of view. Moderate to severe dependence of alcohol has been linked to variety of sleep disturbances, which can have major consequences on the underlying alcohol dependence. It affects the overall health and social welfare of these patients. The knowledge of these sleep disturbances can be used to psycho educate these patients regarding this detrimental effect of excessive and chronic alcohol consumption so as to spread awareness in the community. An observational, cross-sectional study was carried out in the Psychiatry outpatient department of a tertiary care teaching hospital in an urban setting with a consecutive sample of 50 patients diagnosed with Alcohol Dependence. Data was collected using a semi-structured proforma, Alcohol Use Disorder Identification Test (AUDIT) and Pittsburgh Sleep Quality Index (PSQI). 74% of the participants in our study reported having poor quality of sleep according to the PSQI scale. Participants with a more severe alcohol dependence had poorer quality of sleep. A statistically significant association was found between sleep latency score on the PSQI scale and the total AUDIT score. Each of the 7 components of the PSQI were assessed. It was found that the highest mean score was found for Habitual Sleep Efficiency indicating that it was the most affected. Our study also showed that young age (<30 years), duration of alcohol intake, occupation (unskilled/semi-skilled) and sleep latency are the predictors of poor quality of sleep among the study participants.

INTRODUCTION

Sleep disturbances constitute a vital part of the symptomatology of Psychiatric disorders. Alteration in sleep can affect one's mental welfare and also psychiatric disorders can lead to sleep disturbances. Alcohol consumption has become a topic of concern from public health point of view worldwide. Out of the total worldwide burden of disease, 5.1% is attributed to hazardous use of alcohol^[1].

Dependence of alcohol is explained as, "a cluster of physiological, behavioural and cognitive phenomena in which the use of a substance or a class of substances takes on a much higher priority for a given individual than other behaviours that once had greater value" by the International Classification of Diseases 10 (ICD-10)^[2].

Alcohol is a powerful substance that causes massive alterations in virtually all neuro-chemical systems of humans. Effects of excessive alcohol consumption include physical problems ranging from fatty liver to liver cirrhosis, pancreatitis, atherosclerosis, gastritis, cardiomyopathy to name a few. The mental and psychological effects of alcohol consumption include dependence, insomnia, psychosis, mood disorders and cognitive impairment.

Moderate to Severe Dependence of Alcohol has been linked to variety of sleep disturbances, which can have major consequences on the underlying Alcohol use disorder. It impacts the global health and social welfare of the patients^[3].

The prevalence of sleep disturbances is vast among persons diagnosed with Alcohol Dependence, some studies reporting it to be as high as 90.4%^[4]. Disruption of one's sleep also leads to difficulties in day-to-day tasks such as concentration issues, memory problems and general quality of life. Thus, a systematic study of the pattern of sleep disturbances is essential in order to properly manage these cases and prevent relapse in the clinical scenario. Understanding the pattern of sleep disturbances in alcohol use disorder will definitely help in motivating these patients to refrain from alcohol use.

MATERIALS AND METHODS

This was an observational, cross-sectional study carried out in the Psychiatry outpatient department of a tertiary care teaching hospital in an urban setting over a period of 4 months. Study was conducted after taking permission from the Institutional Research Committee.

Assuming 36% prevalence of insomnia in alcohol dependence, reported by Chakravorty *et al*^[3], a sample of 45 participants would be required for estimating true proportion with 14% precision and 95% Confidence Interval, hence, we decided to include total

50 patients in this study. A consecutive sample of 50 patients diagnosed with Alcohol Dependence was selected from tertiary care setting by convenience sampling method.

This study aimed at understanding the pattern of sleep disturbances in patients with Alcohol Dependence visiting the psychiatry outpatient department at a tertiary care hospital and to find their correlation if any, with various Socio-Demographic characteristics.

After obtaining their written informed consent, each participant was individually interviewed using a semi-structured proforma prepared for the study which included socio-demographic profile, clinical and psychiatric profile. To assess the use of alcohol use, Alcohol Use Disorder Identification Test (AUDIT) was administered. It consists of 10 questions which are graded from 0-4 each. Its total score varies from 0-40. Score 1-7 is suggestive of low-risk consumption. Scores from 8-14 are indicative of "hazardous/harmful alcohol consumption and a value of=15 suggests "Alcohol Dependence^[5]. The comparable median reliability coefficient of AUDIT is 0.83, with a range of 0.75-0.97^[6].

To assess the sleep disturbances, Pittsburgh Sleep Quality Index (PSQI)⁷ was used which is a self-report questionnaire designed to assess the sleep quality over a period of one month. PSQI consists of total 19 items. These items are integrated to produce 7 components and one global score. Individual component scores comprise of 0-3 and the "Global PSQI scores" vary from 0-21. Higher score values suggest poorer quality of sleep. A PSQI global score of "5 or more" shows "poor sleep quality". Each component of PSQI describes a distinct and essential parameter for assessment of sleep such as "subjective sleep quality", "sleep latency", "sleep duration", "habitual sleep efficiency", "sleep disturbances", "use of sleeping medication and "daytime dysfunction". Studies have established that, PSQI has good internal consistency (Cronbach's a range = 0.70–0.83)^[8].

Data were analysed in STATA, version 10.1 (2011) -statistical software by StataCorp, Texas USA. Descriptive statistics (mean, standard deviation) was calculated to summarize quantitative variables and frequency with percentage was used to describe qualitative variables. Correlations between PSQI scale and its seven components with AUDIT scores were assessed with Spearman's rank order correlation coefficient along with p-values.

Multiple Logistic Regression analysis was also performed to evaluate association between a binary outcome i.e. Sleep quality and some important characteristics of the participants significance of which was already proven in bivariate analyses. P-value was set at 5% level to establish statistical significance.

RESULTS AND DISCUSSIONS

Out of the total 50 participants, all were male. 62% of the participants were between the ages of 31-45 years. The average age of participants in this study was 36.78 years (SD=8.14).

4% participants had received no formal education, 6% had completed primary, 60% had completed secondary, 18% higher secondary, 8% graduate and 4% had completed postgraduate education.

Occupation wise, 6% participants were unemployed, 32% performed unskilled work, 50% performed semiskilled work and 12% performed skilled work. 78% of the participants were married.

48% of the participants had been consuming alcohol for 11-20 years. 74% participants had started their alcohol consumption before the age of 25 years. All participants had a daily pattern of alcohol consumption. 66% participants consumed Country Liquor (CL), 24 % consumed Indian Made Foreign Liquor (IMFL) and 10% consumed both.

All the participants (100%) were Alcohol Dependent as per the AUDIT score. Mean AUDIT score was 26.5 (SD=5.94).

74% participants had global PSQI score >5, indicating poor sleep quality. Mean Score of PSQI was 8.86 (SD=4.32), which is well above the cut off mark of 5 suggesting presence of significant sleep disturbances.

This study showed that, participants with higher PSQI scores also had higher AUDIT scores, indicating that, more severe the alcohol dependence, poorer is the quality of sleep.

In younger participants, alcohol dependence elevates risk of poor sleep quality by almost 6 times as compared to their older counterpart when adjusted for their occupation duration of alcohol intake and sleep latency.

Longer duration of alcohol intake among study participants elevates the risk of poor sleep quality by almost 1.25 times as compared to their other counterpart when adjusted for their age, occupation and sleep latency.

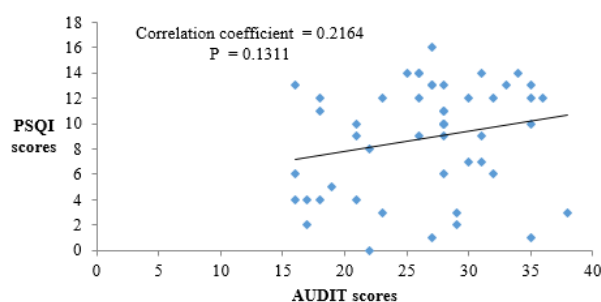


Fig. 1: Fairly strong, positive correlation between AUDIT score and global PSQI score

Unskilled or semi-skilled occupation also elevates risk of poor sleep quality by almost 1.32 times as compared to their skilled counterpart when adjusted for their age, duration of alcohol intake and sleep latency.

Demographic Details: The average age of participants in this study was 36.78 years (SD=8.14). Hartwell *et al.*^[9] stated in their study that, the average age of participants was 31 years and SD was 10.5. All participants in this study were males. This may be due to a greater stigma in India attached to female drinking^[10]. It is attributed to the social and cultural variations between Indian and Western societies. As mentioned in the -National Family Health Survey (NFHS-5)^[11], 1.3% women consume alcohol which is not reflected in our study.

In this study, the maximum (60%) of the participants had completed their secondary education, followed by participants who had completed higher secondary education (18%). In the study carried out by Sarkar *et al.*^[10] maximum participants (45.99%) had not received any formal education, followed by participants who had completed their secondary education (27.27%), followed by participants who had completed their primary school education and rest of them were educated up to higher secondary and above.

In the present study, 6% participants were unemployed, 32% performed unskilled work, 50% performed semiskilled work and 12% performed skilled work. In this study, more than three-fourth (78%) of the participants were married. In the study conducted by Sarkar *et al.*^[10] majority (82.35%) of the participants were married and rest were single.

Details about Alcohol Consumption: In this study, about half (48%) of the participants had been drinking alcohol for 11-20 years, 42% for <10 years and a minority (10%) for more than 20 years.

About three-fourth (74%) of participants started consuming alcohol before 25 years of age. According to Cloninger's typology of alcoholism, the type II has a younger age of onset usually before the age of 25 years. It is also associated with a novelty seeking behaviour and criminality^[12]. Participants with younger age at the time of commencement of consumption and a longer total duration of alcohol intake have a notably higher risk of developing dependence or any other alcohol related disorder.

About two-third (66%) of the participants in this study consumed CL, 24% consumed IMFL and 10% consumed both. This corresponds to the data available

Table 1: Socio-demographic characteristics of study participants (n=50)

Details	Levels	Frequency	Percentage (%)
Age	≤30 years	12	24
	31 - 45 years	32	62
	46 - 60 years	7	14
Gender	Male	50	100
	Female	0	0
Formal school education	Nil	2	4
	Primary	3	6
	Secondary	30	60
	Higher secondary	9	18
	Graduate	4	8
	Post Graduate	2	4
Occupation	Unemployed	3	6
	Unskilled	16	32
	Semi-skilled	25	50
	Skilled	6	12
Marital status	Single	11	22
	Married	39	78

Table 2: Details about Alcohol Consumption among participants (n=50)

Details	Levels	Frequency	Percentage (%)
Total duration of alcohol intake	≤ 10 years	21	42
	11 - 20 years	24	48
	≥ 21 years	5	10
Age at starting alcohol consumption	≥ 25 years	37	74
	25 years	13	26
Pattern of alcohol consumption	Daily	50	100
	Binge	0	0
Type of alcohol	CL	33	66
	IMFL	12	24
	Mixed	5	10

Table 3: Mean score, Standard Deviation and Coefficient of Variation of AUDIT and PSQI scale (n=50)

Scale	Mean score	SD	Minimum	Maximum	Coefficient of Variation
AUDIT	26.5	5.94	16	38	22.42%
PSQI	8.86	4.32	0	16	48.76%

Table 4: Distribution of participants (n=50) according to severity levels measured on two scales

Scales	Levels of severity	Frequency	Percentage (%)
AUDIT	Low risk consumption (score 1 to 7)	0	0
	Hazardous consumption (score 8 to 14)	0	0
	Alcohol dependence (score = to 15)	50	100
PSQI	Good sleep quality (score = 5)	13	26
	Poor sleep quality (score > 5)	37	74

Table 5: Descriptive statistics for seven components of PSQI scale (n=50)

Sr. No.	Components of PSQI	Minimum	Maximum	Mean	SD
1	Subjective Sleep Quality	0	3	1.5	1.03
2	Sleep Latency	0	3	1.94	1.13
3	Sleep Duration	0	3	1.9	1.18
4	Habitual Sleep Efficiency	0	3	2.02	1.3
5	Sleep Disturbances	0	3	0.74	0.49
6	Use of sleeping medications	0	3	0.16	0.62
7	Daytime Dysfunction	0	3	0.6	0.93
	Global PSQI Score	0	16	8.86	4.32

Table 6: Association of each component of PSQI scale with Total AUDIT score

Sr. No.	PSQI Components	Rho (Spearman's rank order correlation coefficient)	P value
1	Subjective Sleep Quality	0.1807	0.2093 (NS)
2	Sleep Latency	0.3819	0.0062
3	Sleep Duration	-0.0381	0.7928 (NS)
4	Habitual Sleep Efficiency	0.1192	0.4095 (NS)
5	Sleep Disturbances	0.0945	0.5139 (NS)
6	Use of sleeping medications	-0.0926	0.5225 (NS)
7	Daytime Dysfunction	0.1138	0.4313 (NS)
	Global PSQI Score	0.1669	0.2466 (NS)

A statistically significant association was found between sleep latency score on PSQI and total AUDIT score (Rho= 0.3819; P value= 0.0062).

Table 7: Results from Multiple Logistic Regression analysis showing important predictors of Poor sleep quality among participants with alcohol dependency

Predictors of poor sleep quality	Odds Ratio	95% Confidence Interval	P value
Age < 30 years	6.54	0.55 - 77.34	0.136
Occupation	1.32	0.44 - 3.93	0.621
Duration of alcohol intake (years)	1.25	1.04 - 1.52	0.020
AUDIT scale Component 2	4.82	1.81 - 12.81	0.002

that, CL is most commonly consumed in India (around 50% of the market)^[13].

Sleep Disturbances: The PSQI was used to identify sleep disturbances in study participants. Mean Score of PSQI was 8.86 (SD=4.32). About three-fourth of the participants (74%) had poor sleep quality as designated by this scale. According to the literature reviewed by Chakravorty *et al.*^[3] the prevalence of sleep disturbances in alcohol dependence is documented to be 36-91%. In the study carried out by Hartwell *et al.*^[9] clinically relevant insomnia was reported by 76% of the participants. Their average global PSQI score of their total sample was 7.4.

Each of the 7 components of the PSQI were assessed. It was found that the highest mean score was found for Habitual Sleep Efficiency (2.02 ± 1.3) indicating that it was the most affected. Koob *et al.*^[14] stated in their study that, during the binge/intoxication stage, alcohol intoxication leads to a faster sleep onset, but the quality of subsequent sleep is poor relative to nights when no alcohol is consumed, with a substantial increase in wakefulness during the sleep period, especially later in the night.

Ebrahim *et al.*^[15] concluded that, reduced sleep onset latency was the most powerful effect of alcohol on nocturnal sleep.

Association of each component of PSQI scale with Total AUDIT score was studied and a statistically significant correlation was found for sleep latency with a P-value of 0.0062.

Multi variate analysis was performed which showed that young age (<30 years), duration of alcohol intake, occupation (unskilled/semi-skilled) and sleep latency were the predictors of poor quality of sleep among the study participants. Of the above four identified factors, two i.e. Age <30 years and occupation are non-modifiable factors. However, other two factors namely duration of alcohol intake and sleep latency are the ones where appropriate life style or socio-clinical modifications can be done so as to improve quality of sleep among the alcohol dependent population.

CONCLUSION

All participants were observed to have alcohol dependence as per the AUDIT scale indicating the severe pattern of alcohol use. It was observed that, 74% of the participants reported poor quality of sleep according to the PSQI scale. Participants with higher PSQI scores also had higher AUDIT scores, indicating that, more severe the alcohol dependence, poorer is the quality of sleep.

Out of the components of sleep, highest mean score was found for Habitual Sleep Efficiency (2.02 ± 1.3) indicating that it was the most affected.

A statistically significant association was found between sleep latency score on PSQI and total AUDIT score. This observation was in contrast with the well documented effects of alcohol in decreasing sleep latency.

Our study also showed that young age (<30 years), duration of alcohol intake, occupation (unskilled/semi-skilled) and sleep latency are the predictors of poor quality of sleep among the study participants.

Conflict of Interest: The authors declare that this research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Limitations: This study was based in a single tertiary care hospital with a considerably small sample size. All participants in this study were males. Thus, the effects of alcohol on sleep disturbances in females could not be studied. Our study was single assessment based. Due to its cross-sectional in design, there was no scope for follow-up of the study participants. Multiple or follow up assessments can give more insight into the nature of sleep disturbances in patients with Alcohol Dependence.

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