

Prevalence of sleep disturbances in patients with liver cirrhosis

Latha K¹, Kanmani Karthikeyan², Viji Devanand³, Gokulnathan V⁴

¹Assistant Professor, ²Associate Professor, ³Professor & Head, ⁴Post Graduate, Department of Physiology, Stanley Medical College, Chennai, Tamil Nadu

Abstract

Background: Disturbed sleep is frequently reported by patients with cirrhosis attending outpatient clinics, but its prevalence, determinants, and consequences are not well understood. **Aim:** To prospectively assess the prevalence of disturbed sleep in patients with cirrhosis. **Materials and Methods:** Consecutive patients with cirrhosis attending the liver clinics between June 2021 and December 2021 were invited to participate. They completed the questionnaire to assess sleep quality using the Pittsburgh Sleep Quality Index (PSQI) and daytime sleepiness using the Epworth sleepiness scale (ESS). Poor sleep according to the PSQI instrument is defined as PSQI > 5. Daytime sleepiness is said to be present for the ESS score > 8. The characteristics of sleep in cirrhotic patients were assessed using a sleep questionnaire. The results were compared with those of healthy subjects. The presence of subclinical hepatic encephalopathy and individual's affective state were also analyzed. **Results:** The questionnaire indicated an elevated number of cirrhotic patients (80%) who complained of unsatisfactory sleep compared with healthy subjects (10%, P value < 0.01). The sleep disturbance in cirrhosis was not associated with clinical parameters nor with cognitive impairment. **Conclusion:** Disturbed sleep is highly prevalent in ambulatory cirrhotic patients, and it is independently associated with poor quality of life. Further studies are needed for better understanding of the pathogenesis of poor sleep and its management strategies in this population.

Key words: cirrhosis, Pittsburgh sleep quality index, sleep disturbance

Corresponding Author

Dr. Gokulnathan. V, Post-graduate, Department of Physiology, Stanley Medical College, Chennai, Tamil Nadu.
Contact No: 9444743881, E-mail: gokspotter73@gmail.com

Introduction

Cirrhosis and chronic liver disease adversely affect neurocognitive functioning. These neurocognitive difficulties severely restrict the patients' functioning and are associated with sleep disturbances.¹ Sleep disturbances are common in

patients with cirrhosis and lead to impaired quality of life. The most common abnormalities are insomnia (difficulty in falling asleep and maintaining sleep, or unrefreshing sleep), excessive daytime sleepiness, and sleep-wake inversion (disturbances of circadian rhythmicity).² The underlying pathophysiological mechanisms for sleep disturbances in cirrhosis are complex and

may include disturbed metabolism of melatonin and glucose, alterations in thermoregulation, and altered ghrelin secretion profiles. Sleep-wake abnormalities are related to the presence of hepatic encephalopathy (HE) and improvement in sleep parameters can be observed when HE is properly managed.³

The PSQI is a 19-item self-rated questionnaire for evaluating subjective sleep quality over the previous month. The 19 questions are combined into 7 clinically-derived component scores, each weighted equally from 0–3. The 7 component scores are added to obtain a global score ranging from 0–21, with higher scores indicating worse sleep quality. The clinical and psychometric properties of the PSQI have been formally evaluated by several research groups. Validity is further supported by similar differences between groups using PSQI or polysomnographic sleep measures. The PSQI has been translated into 48 languages and has been used in a wide range of population-based and clinical studies.⁴

The ESS is a self-administered questionnaire with 8 questions. Respondents are asked to rate, on a 4-point scale (0-3), their usual chances of dozing off or falling asleep while engaged in eight different activities. Most people engage in those activities at least occasionally, although not necessarily every day. The ESS score (the sum of 8 item scores, 0-3) can range from 0 to 24. The higher the ESS score, the higher that person's average sleep propensity in daily life (ASP), or their 'daytime sleepiness'. The questionnaire takes no more than 2 or 3 minutes to answer. It is available in many different languages.⁵

Aim and Objectives

To assess the subjective sleep quality in cirrhotic liver disease patients using Pittsburgh Sleep Quality Index (PSQI) and assess the "daytime

sleepiness" using the Epworth sleepiness scale (ESS).

Materials and Methods

This was a cross sectional study completed in a period of 6 months at Stanley Medical Hospital. Sample size for the study was 80.40 healthy individuals belonging to the control group were selected randomly from general population. 40 subjects belonging to the case group were selected from the Medicine Department of Stanley Government hospital. Data collection was done after obtaining Institutional Ethical Committee clearance. The purpose of the study was explained to the subjects and written informed consent was obtained. The diagnosis of cirrhosis was made based on suggestive clinical features, deranged liver function tests, and evidence of portal hypertension on ultrasonography and endoscopy. Patients diagnosed with cirrhosis of the liver were assessed for subjective sleep quality using Pittsburgh Sleep Quality Index (PSQI). Daytime sleepiness among the subjects was assessed using the Epworth sleepiness scale (ESS).

Inclusion criteria

- Patients with cirrhosis or chronic liver disease with no evidence of overt Encephalopathy (Grade 1 as per West Haven Criteria, Class 'B' in Child-Pugh Criteria).
- Patients between the age group of 20 years and 60 years
- Individuals of either sex

Exclusion criteria

- Primary neurologic and psychiatric disorders
- Cardiovascular diseases
- Diabetes mellitus
- Chronic renal disease
- Active gastrointestinal bleed

- Alcohol intake within last three months
- Consumption of drugs acting on the CNS
- Visual and hearing impairment

Statistical analysis

The data obtained were analyzed by using Statistical Package for Social Sciences (SPSS) version 20. The categorical variables were expressed in percentage.

Table 1: Age distribution of the study participants

Age (Years)	No. of Subjects	Percentage
35&Below	16	20.0%
36 - 45	33	41.3%
46 &Above	31	38.8%
Total	80	

Graph 1: Age distribution of the study participants

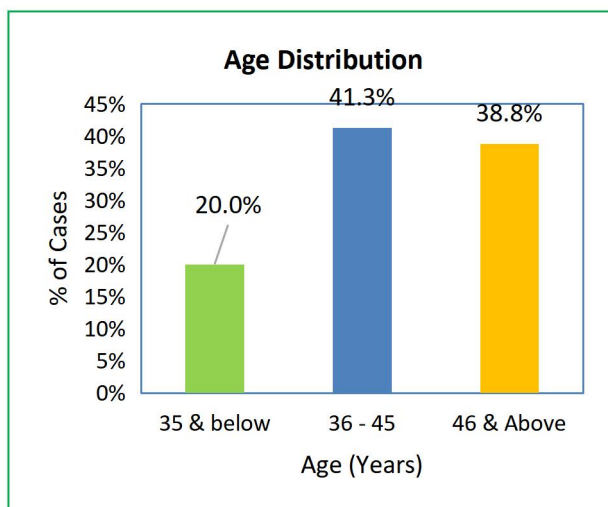
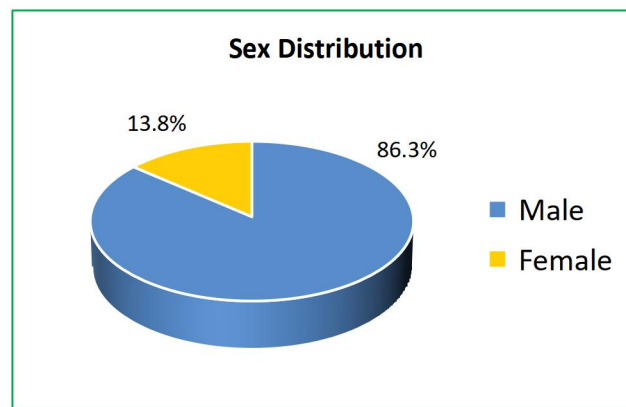


Table 2: Sex distribution of the study participants

Sex	No. of Subjects	Percentage
Male	69	86.3%
Female	11	13.8%
Total	80	

Graph 2: Sex distribution of the study participants



Results

Mean age of the subjects belonging to study group (cirrhotic patients) is 51 years. Mean age of the subjects belonging to control group (healthy subjects) is 43 years.

The sleep quality of the participants has been presented in table 3. Daytime sleepiness among the participants is presented in table 4. The characteristics of sleep are presented in Table 5. Cirrhotic patients showed a significantly higher prevalence of sleep disturbance than the healthy control group. Most of the cirrhotic patients, 80% complained of unsatisfactory sleep, whereas this complaint was infrequent in the healthy subjects (10%). Unsatisfactory sleep was present for 5 or more years in eight cirrhotic patients.

The comparison of parameters of nighttime sleep between the two groups showed a significantly higher proportion of subjects referring short sleeping time (<6 h/night), difficulties falling asleep (sleep latency >30 minutes) and more frequent nocturnal awakenings in the cirrhotic patients group. In addition, daytime functioning of these patients was affected by higher episodes of undesired sleepiness and more prolonged napping time.

In cirrhosis, unsatisfactory subjective sleep quality was associated with worsening objective parameters of nighttime sleep and daytime

functioning. In the healthy control group, the small number of individuals with unsatisfactory sleep precludes meaningful associations.

Table 3: Sleep quality among the groups using PSQI

	Healthy subjects (n=40)	Cirrhotic patients (n=40)	P Value
Good sleep quality(PSQI<5)	36	8	<0.01
Poor sleep quality(PSQI>5)	4	32	<0.01

Table 4: Daytime sleepiness among the groups using ESS

ESS	Healthy subjects (n=40)	Cirrhotic patients (n=40)	P Value
Daytime sleepiness(ESS>8)	35	11	<0.01
No daytime sleepiness(ESS<8)	5	29	<0.01

Table 5: Characteristics of sleep among groups

	Healthy subjects (n=40)		Cirrhrotic patients (n=40)	
	Satisfactory sleep	Unsatisfactory sleep	Satisfactory sleep	Unsatisfactory sleep
Number	36	4	8	32
Sleeping time < 6h/night	5	4	4	23
Sleep latency >30 min	2	2	3	17
Awakenings (episodes/night)	0.9±0.1	1	1.7±0.3	4.1±0.6
Daytime naps (minutes/day)	7±2	14±3	19±3	49±8

Discussion

The results of this study demonstrate that patients with cirrhosis and no evidence of hepatic encephalopathy have poor sleep quality. Nearly one half of patients attending a Liver Clinic complained of unsatisfactory sleep, a frequency slightly greater than that previously reported with quality-of-life questionnaires.⁶ Analysis of sleep questionnaires in both groups of patients showed a nocturnal sleep characterized by reduced sleeping time and frequent awakenings.⁷ These results raise the possibility that our findings of disturbed sleep may be nonspecific, reflecting the impact of chronic disease on daily functions.

The majority of patients experienced sleep disturbances for less than 5 years, indicating a direct link between chronic liver illness and sleep disturbances. This causal relationship is also supported by the substantial improvement in the area of sleep that has been observed after liver transplantation.⁸ In the cirrhotic patients' group, 15 out of the 32 patients who had poor sleep quality had no history of alcohol consumption. So, the etiology of cirrhosis was not a discriminant factor in this group of alcohol-free patients, which is consistent with recent observations of noncognitive impairments present in all kinds of cirrhosis.⁹

Circadian disturbances are linked to the development of hepatic encephalopathy. The Rats after portocaval anastomosis are a model of subclinical encephalopathy.¹⁰ They showed disruption in their circadian rhythms.¹¹ Thus, it can be hypothesized that sleep disturbance in cirrhosis may be a manifestation of minor forms of encephalopathy. The prevalence of cognitive impairment detected in our patients is in accordance with the study made by Blei and Cordoba et al.¹²

It was previously postulated that in cirrhosis, alterations of the function of the suprachiasmatic

nucleus—the hypothalamic biological clock—may result in an array of circadian abnormalities.^{13,14} The transitory sleeplessness that occurs with jet lag or shift work is mediated by the desynchronization of the social and internal rhythms.¹⁵ Similarly, sleep irregularities, such as sleep disruption, may arise as a result of aging-related failing circadian timekeeping systems.¹⁶ Analysis of sleep patterns in cirrhotic patients with sleep disturbance indicated that these subjects had a delayed bedtime, delayed wake-up time, and preference for evening activities as compared with those with normal sleep. A propensity for nighttime activity could indicate a change in circadian function, such as a shift toward later hours as a result of a change in the circadian clock's output or its afferent/efferent connections. A shift toward later hours in the 24-hour profile of plasma melatonin, which has levels that mirror the output from the circadian clock, was reported in cirrhosis in a prior study.¹⁷

Cirrhosis-related sleep disturbances could be linked to the desynchronization of the circadian timekeeping system, according to certain theories. The inversion of sleep patterns seen in people with overt encephalopathy could be the most extreme example of this shift. Cirrhosis-related circadian abnormalities may be caused by a number of factors, including the impact of gut-derived toxins on the brain, decreased sensorial inputs that entrain the circadian clock, such as insufficient light exposure, social isolation, or low levels of activity, as well as retinohypothalamic and endocrine (e.g., melatonin) abnormalities.¹⁸

Conclusion

The current study points to a probable link between sleep problems and changes in circadian timekeeping mechanisms. Underlying pathophysiological mechanisms are complex and include disturbed metabolism of melatonin. Because sleep–wake disorders arise when HE is present, HE therapy is the cornerstone of

treatment. Recognizing sleep disturbance in cirrhosis and comprehending the underlying pathophysiological causes may lead to treatments that improve patients' quality of life.

Limitations

This study assessed only subjective sleep symptoms and lacks polysomnography data. Due to the increased potential for medication toxicity in these disabled patients, further studies are needed to address the potential role of non-drug therapies in this population such as cognitive behavioral therapy, mindfulness, yoga, that have demonstrated usefulness in insomnia disorders.

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Conflict of interest: Nil

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Hematology Practical Assessment using Objective Structured Practical Examination (OSPE) with the traditional method in Physiology for the first year MBBS students - A comparative study

Thenmozhi R ¹, Selva Sudar Vinojini ²

¹ Professor, Department of Physiology, Government Vellore Medical College,

² Post Graduate, Department of Physiology, Tirunelveli Medical College, Tirunelveli, Tamil Nadu

Abstract

Introduction: Globalization of education and healthcare system is to provide a good quality of medical education to the students. Practicing uniformity in the basic level competencies and assessment of newer learning experiences will be of less stress to the learners. The aim of a formative assessment is to identify areas that may need improvement. At present very limited percentage of marks to OSPE has been allotted in Formative and Summative Assessment. **Aim:** To evaluate the effectiveness of OSPE as an assessment tool. **Materials and methods:** This was a Cross-sectional study and done after getting the approval from the Institutional Ethics Committee. 250 MBBS students of 2019 batch were divided into two groups. One group was given OSPE and the other with the routine procedure TPE. The procedures for OSPE were discussed with the faculty and the laboratory technicians. A detailed Checklist was prepared for each procedural station and were scrutinized by the faculty. **Results:** The mean scores obtained by both groups of OSPE and TPE were compared using paired t test. p value was obtained which was 0.001 and was highly significant. Scoring of marks with OSPE was better. The feedback form implies that OSPE pattern was more objective, it tested the clinical skills and acquiring knowledge was better. **Conclusion:** OSPE assesses all three domains of learning. It can be used as a tool in the formative and summative assessment to achieve the higher standards.

Key words: assessment check list, clinical skills, feedback, objective structured practical examination, questionnaire

Corresponding Author

Dr. Thenmozhi. R, Professor, Department of Physiology, Govt. Vellore Medical College, Vellore, Tamil Nadu.
Contact No: 9840305964, E-mail: thenmozhiramaswamy049@gmail.com

Introduction

A curriculum can develop medical education to produce an efficient Indian medical graduate to the International standard. The assessment of the subjects with a uniformity in the basic level competencies will reduce the stress of the learners.

To initiate active learning, the assessment tools need to be effective. The focus of a formative assessment is to identify areas that may need improvement. The practical and clinical skills can assess the psychomotor, performance, and communication skills of the students. The traditional methods may be time consuming, lead to examiner bias in assessing the students. We

have a very limited percentage of marks to OSPE in our formative and summative examinations. We have to develop the better assessment tool to improve learning and help students to achieve a higher standard. We evaluated OSPE for the assessment of practical skills in physiology hematology practical examination for undergraduate medical students and compared it with traditional practical examination (TPE).

Aim

To evaluate the effectiveness of OSPE as an assessment tool for the hematology practical examination in the first year MBBS curriculum.

Objectives

To study the feasibility and acceptability of OSPE among the students and faculty members.

Materials and methods

After obtaining approval from Institutional Ethical committee, this study was conducted in Department of Physiology

Study design: Cross-sectional study.

Study Group: 250 MBBS students of 2019 batch were included in the study

Methodology: 250 students were divided into two groups and the exams were conducted for ten days with 25 students in one batch. First group of students were given OSPE in the examination and the second group of students were given traditional practical examination. A standard questionnaire was given to each student at the end of the examination. The procedure for OSPE was discussed with the faculty and the laboratory technicians. A detailed checklist was

prepared for each procedural station and were scrutinized by the faculty. The technical staffs were briefed about the procedure. The students were introduced to the OSPE system by short lecture and demonstration by the faculty members. Hemoglobin estimation was taken for this study. Seven stations were divided for the practical procedures. 5 point Likert scale was used for questionnaire preparation. Scores and feedback from the students and faculty were obtained through questionnaire.

Statistical analysis

The mean scores obtained from both the groups by OSPE and TPE were compared using paired t test and p value was obtained. p value was 0.001 and was highly significant.

Statistical analysis of the 5-point Likert scale was done in terms of percentage of students.

Results

All 250 students (100%) completed the questionnaire. The feedback was obtained from the students and the faculty. 88% of the students felt OSPE was useful mode of assessment in their practical examination. 70 to 75% had less physical effort and mental stress while doing the procedure. Fairness of the examination and assessment was about 86%. 85% of the students felt, they had adequate time to perform the procedure. 90% of the students felt OSPE was one of the best methods for assessment. Inference from the faculty showed that, the OSPE pattern was more objective and it tested the clinical skills and knowledge of the students in a better aspect. This method was unbiased and scoring of marks with OSPE was also better than TPE. Feedback given to students after the OSPE session helped them in their further learning process.

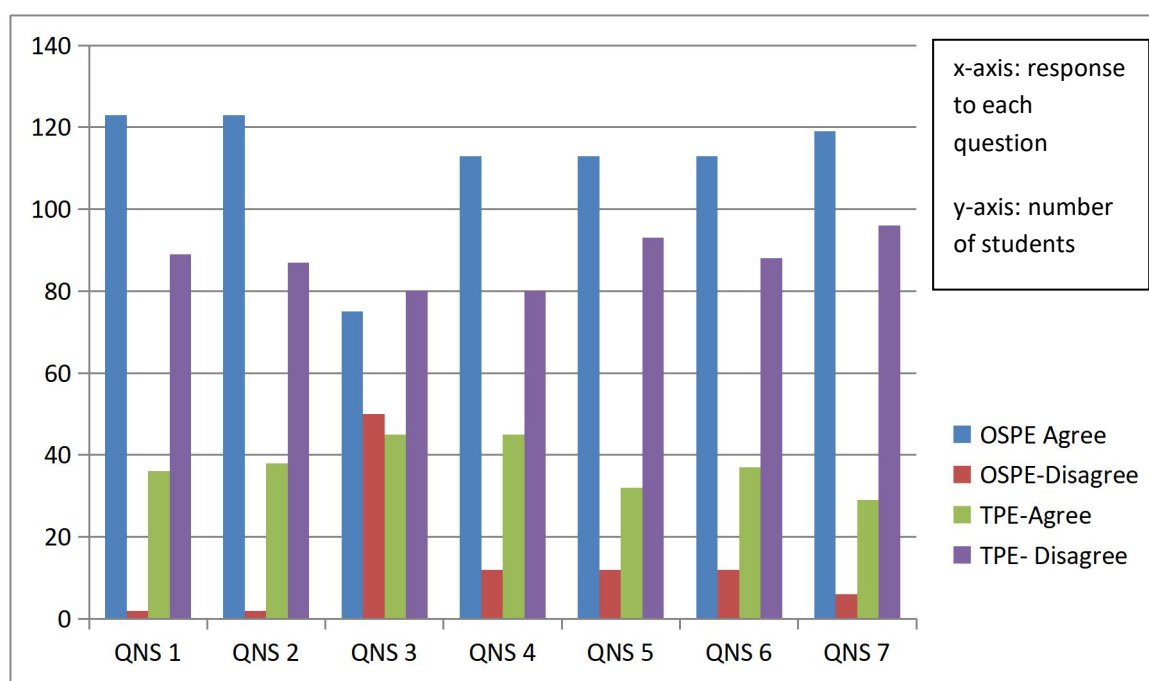
Table 1. Feedback from students

Question number	OSPE RESPONSE		TPE RESPONSE	
	Agree	Disagree	Agree	Disagree
1	123	2	36	89
2	123	2	38	87
3	75	50	45	80
4	113	12	45	80
5	113	12	32	93
6	113	12	37	88
7	119	6	29	96

*Agree – Accepted the assessment method

*Disagree – Not accepted the assessment method

Chart 1. Feedback from students for OSPE and TPE



Discussion

This study was conducted to check the feasibility of adopting OSPE as a mode of assessment in our institution. In our study 88% of the students felt OSPE was useful mode of assessment in their practical

examination. 70 to 75% had less physical effort and mental stress while doing the procedure. Fairness of the examination and assessment was about 86%. 85% of the students felt, they had adequate time to perform the procedure. 90% of the students

felt OSPE was one of the best methods for assessment.

Based on the scores obtained from the students (Table 1), students performance in OSPE was better than the TPE.

The common complaints of students in TPE were

- i) Inequality of marks given by the examiners,
- ii) Selection of experiments were based on picking up lots and
- iii) Lot of uncertainties in assessment.

OSPE, being an objective, valid and reliable tool of assessment, has overcome all the above said drawbacks of TPE.

V.Suganthi (2019) felt that OSPE has helped the students to learn procedures in a systematic manner and she recommended OSPE can be used as a teaching/learning tool. According to her, the objective and clinical skills were tested better and it has eliminated examiner bias.¹

Sayed Ali Mard Samireh Ghafouri registered that TPE method involves performing a particular experiment randomly and the assessment is based on the performance of the whole rather than individual skills. According to Miller's framework of "knows" and "knows how" aspects the OSPE questions had a relevant wider area of knowledge, and comprehensive skill in comparison to the TPE group.²

Revathi M (2019) felt the students perceived that the OSPE examination as an unbiased and easy way to score marks. It had a better content which was relevant to the topics. It also helped the students in achieving application skills than memorizing and recalling.³ Farkhanda Jabeen et. al., has

studied that most of the students took OSPE as a reliable method of examination.⁴

In Hasan S (2009) study, showed that Objective Structured Practical Evaluation appears to be important for performance discrimination of individual learning competencies and attitude towards learning.⁵ Radhika Gujjala (2015) suggested that OSPE is a better tool of assessment as it can assess all the three domains – Cognitive (analytical questions in unobserved stations), psychomotor (step-wise demonstrations of procedures) and affective (Communication skills).⁶

Prerana P, Bhinganiya et. al felt that Student's feedback on this pattern of assessment was positive and they felt that the clinical skills and knowledge were adequately and uniformly tested. The examiner bias was eliminated. Some students have given feedback that it was stressful as this was the first time they were exposed to OSPE.⁷ S.D. Mamatha et. al, studied that both the Students and the Faculty have recommended the usage of OSPE as a better assessment tool of assessment than TPE.⁸

Conclusion

This study proved that the assessment methods of more objective and competence based was helpful to the students. It can improve the skills of all domains among the students. The students achieved the competencies well and it showed that understanding of the subject was good with OSPE.

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Conflict of interest: Nil

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