Original Article

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Excessive Daytime Sleepiness in Schizophrenia: A Naturalistic Clinical Study

Psychiatry Section

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ABSTRACT

Introduction: Excessive Daytime Sleepiness (EDS) and sleep problems are common in patients with schizophrenia. The symptom of EDS in schizophrenia can be attributed to various causes including neurobiological changes, sleep disorders, medication or as a symptom of schizophrenia itself. EDS as a symptom in schizophrenia has been understudied.

Aim: To assess the prevalence of EDS and to the study the same in patients with first episode and chronic schizophrenia.

Materials and Methods: In this cross-sectional study 100 patients suffering from schizophrenia as per International Classification of Diseases (ICD-10) criteria were evaluated for sleep quality using the Pittsburgh Sleep Quality Index (PSQI) and EDS using the Epworth Sleepiness Scale (ESS). The severity of illness was assessed by Positive and Negative Symptom Scale for Schizophrenia (PANSS) while cognition was assessed using the Frontal Assessment Battery (FAB) and the Trail Making Test A and B. The data was statistically analysed.

Results: A total of 100 patients (72 male and 28 female) aged 18 to 64years (mean age 30.63 years) were studied. Poor sleep quality (PSQI > 6) was exhibited by 83% of patients. Excessive daytime sleepiness (ESS > 7) was found in 32% of patients. There was no statistically significant difference in various parameters according to the age, duration of illness or gender. However, first episode patients differed in having better sleep quality than patients with chronic schizophrenia (p=0.0002). Cognition was not affected by sleep quality.

Conclusion: A high prevalence of sleepiness and poor sleep quality was noted in the entire sample but it did not have any correlation with age and gender. It also did not affect the cognitive test scores. Further research in this area is warranted.

Keywords: Epworth sleepiness scale, Frontal assessment battery, Poor sleep quality index, Positive and negative symptom scale for schizophrenia, Sleep

INTRODUCTION

Sleep problems and poor sleep quality is a commonly reported complaint in patients with schizophrenia [1]. Decreased total sleep time, decreased sleep efficiency, nightmares and Excessive Daytime Sleepiness (EDS) have been reported in studies with patients of chronic schizophrenia [2]. The reasons for sleep disturbances and poor sleep quality in schizophrenia may be attributed to various causes. These range from changes in neurobiology due to schizophrenia [3], as a part of negative symptoms [4], drug induced sleepiness after antipsychotic sedative action [5] and alterations in the sleep wake cycle [6]. Sleep as a factor in the clinical symptom profile of schizophrenia has been understudied [7]. Various inconsistencies remain with regard to sleep patterns in schizophrenia and these often range from a decreased sleep at night to increased daytime sleepiness, multiple intermittent awakenings and various polysomnographic changes that have been reported in anecdotal studies [8-10]. It is also unclear whether parameters like age of onset of schizophrenia, total duration of the illness, total number of antipsychotic medication, gender, presence of delusions and hallucinations and genetic factors may affect sleep in schizophrenia.

AIM

To assess the prevalence of EDS and poor sleep quality in patients with schizophrenia along with studying the differences in patterns of sleep disturbance between patients of first episode and chronic schizophrenia.

MATERIALS AND METHODS

The study population were 100 patients with schizophrenia who were attending the outpatient clinic of the Department of Psychiatry at a tertiary care centre and medical college during June to August 2015. All patients were diagnosed as having schizophrenia as per the International Classification of Diseases (ICD-10) criteria [11]. An equal number of first episode as well as chronic patients with schizophrenia were consecutively sampled. All patients were on medication (non sedative – hypnotic) and currently following up at the outpatient clinic. Patients included in the study had a primary diagnosis of schizophrenia with no other psychiatric disorder or personality disorder. They were also not having any form of substance use other than nicotine. Patients with major medical, surgical and neurological disorders that could affect the study were excluded from the study. Patients on benzodiazepines were also excluded from the study. Age range of patients chosen for the study was 18-65years. The patients and their relatives were explained about the study and written informed consent was obtained from the relatives or patients where appropriate. The study was approved by the institutional ethics committee.

All patients enrolled in the study were assessed on the following parameters –

Positive and Negative Symptom Scale for Schizophrenia (PANSS) – The PANSS scale is a very reliable and widely used scale in the rating of schizophrenia. The PANSS includes 30 items, each rated from 1 (absent) to 7 (extreme). Though the score range on the PANNS is 30 to 210, stable outpatients usually score 60 to 80. Acute patients may score exceeding 80 and upto 110. The PANSS has three subscales – the positive symptom scale, the negative symptom scale and the general psychopathology scale in addition to a total score [12].

Pittsburgh Sleep Quality Index (PSQI) – The scale is a 19 item scale that measures the quality of sleep. It has 19 items that generates scores on 7 components like sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medication and daytime sleep dysfunction [13].

Epworth Sleepiness Scale (ESS) – It is a self-administered questionnaire with 8 questions. It provides a measure of a person's general level of daytime sleepiness, or their average sleep propensity in daily life. The ESS asks people to rate, on a 4-point scale (0–3), their usual chances of dozing off or falling asleep in 8 different situations or activities that most people engage in as part of their daily lives, although not necessarily every day. It has been used widely as a standard measure of daytime sleepiness [14].

Frontal Assessment Battery (FAB) - It is a brief tool that can be used at the bedside or in a clinic setting to assist in discriminating between dementias with a frontal dysexecutive phenotype and Dementia of Alzheimer's Type (DAT). Total score is from a maximum of 18, higher scores indicating better performance [15]. This tool was used in the study as an assessment of frontal lobe function which is often affected from a neurocognitive standpoint in schizophrenia and first episode psychosis. The Liverpool University Neuroleptic Side Effect Rating Scale (LUNSERS) – It is a brief scale to indicate the extent of side-effects experienced by patients medicated with neuroleptic drugs. The scale is small and can be completed by either patient or relative within 5-15 minutes [16]. All scales were administered by the same researcher (a psychiatrist and a qualified mental health professional) and in a single setting. A relative was present with the patient during the assessment.

STATISTICAL ANALYSIS

Statistical analysis was done using SPSS version 15.0 for Windows. Mean and standard deviation was calculated for all scores. The study population was divided into groups based in the cut off scores on the PSQI (total score > 6) and ESS (total score > 7), on the basis of gender and on whether first episode or chronic schizophrenia and compared. Chi square test was used for analysing categorical variables while continuous variables were compared using a one-way ANOVA. The groups were compared using independent sample t-test and Mann-Whitney U test where applicable.

RESULTS

The mean age of the total sample (n=100) was 30.63 ± 8.7 years with a range of 18-64 years. The mean duration of illness for the entire sample was 4.33 ± 6.07 years with a range of 1 month to 30 years and the mean score on PANSS was 83.04 ± 18.82 with a range of 54 to 128. There were 72 male and 28 female subjects. Fifty five patients used nicotine in some form. Forty seven of the patients had received electroconvulsive in the past 6 months as treatment.

Out of the total sample ESS scores of > 7 was noted in 32 (32%) of patients while PSQI score > 6 was noted in 83 (83%) of cases. On comparing the sample on the basis of gender, high ESS and high PSQI no significant difference was noted on any of the other scales between groups [Table/Fig-1].

When first episode and chronic schizophrenia patients were compared, statistically significant differences were noted on the PANSS scores (p=0.002) and PSQI (p=0.019) scores with patients of chronic schizophrenia exhibiting higher scores [Table/Fig-2].

When correlated, the scores on ESS for the entire group showed a positive correlation with PSQI scores (p=0.0002) [Table/Fig-3]. None of the groups showed any major difference on the LUNSERS or side effect due to medication. All the patients were on atypical antipsychotics like Risperidone, Olanzapine and Amisulpride either individually or in a combination. Some patients were on a combination of typical and atypical antipsychotics. Details of medications were not noted as they were not the primary aim of the study. Assessment for side effect was cross-sectional and a detailed thorough assessment was not possible due to the cross sectional nature of the study. None of the patients were on sedative-hypnotics or benzodiazepines.

Parameters	Mean ±SD (Range)		p-value
	Males (n=72)	Females (n=28)	
Age in years	31.32 ± 9.718 (18-64)	28.86 ± 5.536 (21-42)	0.210[a]
Duration of illness	4.46 ± 6.49 (1month–30 yrs)	3.99 ± 4.9 (1month-20 yrs)	0.735[a]
PANSS scores	81.13 ± 18.39 (54-124)	87.96 ± 19.315 (56-128)	0.102[b]
PSQI scores	5.40 ± 2.85 (1-20)	6.68 ± 4.52 (1-23)	0.252[b]
ESS scores	5.71 ± 2.36 (1-10)	6.32 ± 2.26 (2-9)	0.215[b]
FAB scores	6.61 ± 5.10 (0-18)	7.50 ± 4.83 (0-17)	0.429[a]
LUNSERS scores	22.01 ± 12.42 (1-46)	21.82 ± 10.96 (4-44)	0.654[b]
	PSQI ≥ 6 (n=83)	**PSQI < 6 (n=17)**	
Age in years	31.40 ± 9.32 (18-64)	26.88 ± 3.97 (22-35)	0.053[a]
Male Female	58 25	14 3	0.297[c]
Duration of Illness	4.86 ± 6.44 (1 month – 30 yrs)	1.70 ± 2.54 (1 month – 7 yrs)	0.050[a]
PANSS scores	83.81 ± 18.78 (54-128)	79.29 ± 19.09 (56-124)	0.289[b]
FAB scores	6.75 ± 4.88 (0-18)	7.41 ± 5.79 (0-16)	0.621[a]
LUNSERS scores	21.45 ± 11.39 (1-46)	24.47 ± 14.67 (1-44)	0.435[b]
	ESS ≥ 7 (n=32)	**ESS < 7 (n=64)**	
Age in yrs.	28.91 ± 7.42 (18-45)	31.44 ± 9.31 (18-64)	0.180[a]
Male Female	21 11	51 17	0.330[c]
Duration of illness	3.86 ± 5.19 (1month – 20 yrs)	4.54 ± 6.46 (1month – 30 yrs)	0.601[a]
PANSS	85.47± 18.39 (56-128)	81.90 ± 19.03 (54-124)	0.377[b]
FAB	6.94 ± 4.88 (0-15)	6.82 ± 5.79 (0-18)	0.916[a]
Lusners	23.03 ± 10.75 (4-44)	21.46 ± 12.56 (1-46)	0.445[b]

[Table/Fig-1]: Assessment of the sample groups on the basis of gender, PSQI and ESS scales.
[a]. ANOVA used in the assessment, [b]. Mann Whitney U test used in analysis, [c]. Chi square test used in the assessment, all p-values were non significant.

Parameters	Mean ±SD (Range)		p-value
	First episode (n=49)	Chronic (n=51)	
Age in years	30.27 ± 8.81 (18-64)	30.98 ± 8.85 (18-52)	0.687[a]
Male Female	38 11	34 17	0.226[c]
Duration of illness	0.25 ± 0.23 (1-3 months)	8.25 ± 6.39 (2 months – 7 yrs)	< 0.01*[a]
PANSS scores	76.86 ± 15.72 (54-109)	88.98 ± 19.75 (55-128)	0.002*[b]
PSQI scores	4.78 ± 1.95 (1-9)	6.71 ± 4.21 (2-23)	0.019*[a]
ESS scores	6.12 ± 1.9 (2-9)	5.65 ± 2.69 (1-10)	0.454[a]
FAB scores	6.51 ± 4.90 (0-17)	7.20 ± 5.14 (0-18)	0.497[a]
LUNSERS scores	24.57 ± 9.54 (13-44)	19.45 ± 13.54 (1-46)	0.005*[b]

[Table/Fig-2]: Comparison between first episode and chronic schizophrenia cases.
[a]. ANOVA used in the assessment, [b]. Mann Whitney U test used in analysis
[c]. Chi square test used in the assessment, *significant (p<0.05).

DISCUSSION

Sleep as a marker for psychopathology has been understudied in schizophrenia. The present study was a small step towards the

	Age	Duration	PANSS	PSQI total	FAB total	LUNSERS
ESS (N = 100)	r = -0.017 p = .863	r = 0.003 p = 0.977	r = -0.183 p = 0.068	r = 0.299 p = 0.0002*	r = 0.152 p = 0.131	r = 0.262 p = 0.008*

[Table/Fig-3]: Correlation between various parameters in the entire sample.
*significant (p<0.05)

same. Sleep quality was poor in 83% of the total sample and is keen in keeping with rates noted in previous studies which are in the range of 50-90% [17-19]. EDS was noted in 32% of the subjects. The cause of the same may not be necessarily schizophrenia and it could have been due to various factors. This finding warrants the fact that daytime sleepiness is a common feature of schizophrenia and needs to be enquired into [20]. Subjects with poor sleep quality or daytime sleepiness showed no difference in cognition and psychopathology. This may be due to the fact that cognition is affected in schizophrenia and poor sleep quality probably adds to a slight worsening of the cognition [21]. It was worth noting that subjects with chronic schizophrenia had significant differences on the PSQI scores (mean score of 6.71 vs 4.78) and this may be due to the fact that chronic schizophrenia has neurobiological changes that may alter sleep physiology [22]. It was surprising that patients with chronic schizophrenia had higher PANSS scores (mean score of 88.98 vs 76.86) which could be due to persistent symptoms and even a non-response to medication. Many confounding factors like medications that subjects had taken in the past, treatments received and longitudinal factors were not considered when the study assessment was done and a clear pinpointing of any cause-effect relationship via the results may not be possible.

The present study is important from a clinical perspective. Many patients suffering from schizophrenia who visit a mental health professional have sleep disturbances that range from EDS to poor sleep quality. It is important that reason and factors that may affect the same be addressed for better outcome in schizophrenia. It is also essential that mental health professionals are aware of sleep disturbances seen in schizophrenia and treat the same when needed. Sometimes sleep related issues may be neglected and the focus may be on positive and negative symptoms rather than sleep.

LIMITATION

The present study was limited to 100 subjects. No power analysis to determine sample size was carried out prior to the study. All were out patients and were in different phases of the illness. Various medical and socio-environmental factors that may have affected the variables were not considered in the assessment. We rather chose an equal number of first episode and chronic schizophrenia reducing the number to approximately 50 in each group. The skewed data as far as gender also did not contribute much to the results. The results of this study are from a small circumscribed sample and cannot be generalized. These limitations need to be overcome in future studies.

CONCLUSION

Sleep disturbances and sleepiness is an integral part of the symptomatology in schizophrenia. The present study does show a difference in sleep quality between first episode and chronic schizophrenia. Further studies in larger sample sizes and diverse populations are needed to validate the results. Medications and other factors affecting sleep in schizophrenia needs to be controlled for the proper approximation of results.

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