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A STUDY OF PREVALENCE OF SLEEP DISORDERS AMONG EPILEPSY PATIENTS

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ABSTRACT

Back ground: It is well known that epilepsy patients have poor sleep quality and excessive daytime somnolence.
Aim: To investigate the prevalence of sleep disturbances in epilepsy patients.
Materials and methods: 100 epilepsy cases and 100 controls were taken into the prospective study .The Epworth Sleepiness Scale (ESS) and Pittsburgh Sleep Quality Index (PSQI) were used to assess EDS and sleep quality.
Results: 83% of PWE had sleep disorders when compared to controls (30%). PWE had significantly higher scores in global PSQI total scores on comparing with controls (9.78 vs. 4.54).
Conclusion: Reduced sleep quality in PWE in PSQI correlated with EDS of ESS. Age at onset of seizures, and generalised epilepsy make the PWE statistically more vulnerable to poor sleep quality thereby having therapeutic implications.

BACKGROUND

Sleep disturbances are common and several studies have shown that both daytime somnolence and reduced sleep quality were common in patients with epilepsy (PWE) [1,2]. The reciprocal interaction between sleep and epilepsy was recognized long ago. Sleep may affect epilepsy by activating inter-ictal discharges and nocturnal convulsions. IEDs occur commonly during NREM sleep due to thalamocortical hyper synchrony. Seizures and IEDs become less during REM sleep. Poor control of seizures may be associated with excessive sleep disturbances. Reduced sleep quality (sleep insufficiency, increased awakenings, delayed sleep onset) and excessive daytime sleepiness (EDS) are common in PWE. The sleep disorders and seizures may have an additive negative impact on quality of life. There are only a few Indian data available regarding this problem.

AIMS

To assess the frequency of sleep disorders in PWE attending neurology opd of TVMCH as well as to evaluate the possible predisposing factors for excessive daytime sleepiness, subjective sleep quality in PWE.

MATERIALS AND METHODS

STUDY DESIGN- Prospective study- case control study

STUDY SUBJECTS-100 PWE attending Neurology OPD and 100 controls who are attendants to other departments of TVMCH were taken into study.

STUDY SETTING- Neurology OPD of TVMCH.

Inclusion Criteria- 100 PWE attending Neurology OPD and 100 controls who are attendants to other departments of TVMCH.

Exclusion Criteria

1. Those with mental retardation, psychiatric co morbidities, COPD, stroke, heart diseases, parkinsonian disorders and sleep disorders.
2. Those with night shift work.
3. Those who are on medications like stimulants, antidepressants, and antipsychotics.
4. Those having chronic alcohol intake.
5. Pregnant and lactating females.
6. Those who are not willing to give consent.

METHODOLOGY

Informed Consent was taken from all participants of the study. Clinical data of PWE like age at onset, duration of illness, aetiology and type of seizure, associated medical diseases, were taken into the study. The Epworth Sleepiness Scale (ESS) and Pittsburgh Sleep Quality Index (PSQI) are two questionnaires commonly used in clinical assessment of EDS and sleep quality. ESS is a standardized scale used for measuring sleepiness that is used to evaluate EDS in PWE[3]. PSQI is a questionnaire that is used to evaluate overall sleep quality which includes subjective sleep quality, sleep latency, sleep duration, sleep efficiency, and sleep disturbance, medication use, and daytime dysfunction[4,5].

ESS is designed to evaluate the general level of daytime sleepiness. In this questionnaire, subjects are instructed to rate, on a scale of 0–3 (never = 0, slight = 1, moderate = 2, high = 3), the likelihood of dozing off or falling asleep in eight different situations. An ESS score ≥10 was considered to be EDS [1,3].

PSQI is a 19-item self-rated questionnaire for evaluating subjective sleep quality over the previous month. The 19 questions are combined into seven clinically derived component scores: subjective sleep quality (C1), sleep latency (C2), sleep duration (C3), habitual sleep efficiency (C4), sleep disturbances (C5), use of sleeping medication (C6), and daytime dysfunction (C7). Each item is weighed equally, and is rated from 0 to 3 (0 = no difficulty, 3 = severe difficulty). The component scores are added to obtain a global score of 0–21, with higher scores indicating worse sleep quality. A global score of 5 or more was taken to be poor overall sleep quality.[4,5]

Statistical analysis

Demographics are described as percentages, mean with SD. Variables between patients and controls are correlated with Fisher's exact test/chi-square test wherever appropriate. P value <0.05 is taken as significant. As the scores of both ESS and PSQI are not normally distributed, a Mann Whitney U test is used to explore the relationship between the groups of PWE and Spearman's correlation was used to explore the correlation between ESS and PSQI. All statistical analyses are conducted using the IBM SPSS software package (version 20).

RESULTS

A total of 100 epilepsy patients and 100 controls were analyzed for sleep disorders. The number of Males in this study is more than that of females with the ratio being 115:85. The mean age of presentation of epilepsy patients is 29.72 ± 19.17 years.

The most common type of presentation in our study is cryptogenic generalised seizures, yet the commonest type of epilepsy being chronic mesial temporal lobe epilepsy. The mean duration of illness is 9.81 ± 12.07 years. 27% of patients with epilepsy are on polytherapy, whereas rest are on monotherapy (73%) (Table 1).

Table 1: Comparison of demographic data of study subjects

	Cases (n=100)	Controls (n=100)
Age	39.46 ± 17.49	37.36 ± 11.90
Gender (M/F)	65/35	50/50
Aetiology, n(%)		
Symptomatic	24%	
Cryptogenic	53%	
Idiopathic	23%	
Seizure type, n(%)		
Partial	46%	
Generalized	54%	
Age of onset	29.72 ± 19.17	
Duration, years	9.81 ±12.07	
Mode of therapy, n%		
Monotherapy	73%	
Polytherapy	27%	

83% of PWE had sleep disorders, whereas 30% of control population had sleep disorders (Table 2). EDS which is measured as ESS ≥ 10 is seen in 14% of PWE when compared to 2% in controls. ESS scores are found to be higher i.e., 6.06 ± 4.07 of PWE when compared to 3.48 ± 3.12 in controls which is statistically significant.

Table2: Comparison of ESS and PSQI scores between cases and controls

parameter	Cases (100)	Controls (100)	P value
ESS	6.06 ± 4.07	3.48 ± 3.12	0.014
ESS>10	14%	2%	0.006
Global PSQI score	9.78 ± 4.12	4.54 ± 3.19	0.033
PSQI>5	83%	30%	0.005
Sleep quality	1.43 ± 0.67	0.70 ± 0.67	0.029
Sleep latency	1.80 ± 1.13	1.16 ± 1.05	0.047
Sleep duration	1.28 ± 1.09	0.70 ± 0.90	0.038
Sleep efficiency	1.37 ± 2.26	0.30 ± 0.70	0.012
Sleep disturbances	1.99 ± 2.02	1.02 0.51	0.041
Medication use	0.66 ± 1.23	0.00 ± 0.00	0.000
Day time dysfunction	1.59 ± 0.80	0.68 ± 0.68	0.015

PWE had significantly higher scores in various aspects of sleep quality in PSQI though they are not amounting to abnormal range. PSQI total global scores are higher in PWE when compared to controls (9.78 ± 4.12 vs. 4.54 ± 3.19). Sleep latency and medication use had higher scores in PWE when compared to controls (1.80 ± 1.13 vs. 1.16 ± 1.05 and 0.66 ± 1.23 vs. 0.00 ± 0.00 respectively). Sleep quality and sleep efficiency are poor as indicated by high scores (1.43 ± 0.67 vs. 0.70 ± 0.67 and 1.37 ± 2.26 vs. 0.30 ± 0.70 respectively) in our study. It is found that on Spearman correlation analysis, poor sleep quality in PSQI positively correlated with excessive daytime sleepiness of ESS. Age at onset of illness, have a direct correlation with poor sleep quality (Table 3).

Table 3: Comparison of PSQI scores among various variables

	PSQI <5 (17)	PSQI > 5 (83)	P value
Age	25.06 ± 12.715	42.41 ± 16.922	0.00
Gender (M/F)	12/5	53/30	0.596
Aetiology, n(%)			0.823
Symptomatic	5 (29.4%)	19 (22.9%)	
Cryptogenic	8 (47.1%)	45 (54.2%)	
Idiopathic	4 (23.5%)	19 (22.9%)	
Seizure type, n(%)			0.044
Partial	10 (58.8%)	36 (43.4%)	
Generalized	7 (41.2%)	47 (56.6%)	
Age of onset, years	18.06 ± 11.25	32.11 ± 19.626	0.005
Duration of illness, years	7.044 ± 6.66	10.379 ± 12.867	0.302
Mode of therapy, n%			0.549
Monotherapy	14 (82.4%)	59 (71.1%)	
Polytherapy	3 (17.6%)	24 (28.9%)	
ESS	3.88 ± 3.33	6.51 ± 4.08	0.015
ESS >10, n %	1 (5.9%)	13 (15.7%)	0.050

DISCUSSION

Our study shows that PWE frequently had more sleep disorders (83%). They had a significantly greater probability of having issues with sleep quality, sleep latency and sleep efficiency when compared with controls. Our study revealed a higher prevalence of sleep disorders like issues with sleep quality, sleep latency, sleep duration, and sleep efficiency which is in concordance with other studies in sleep by Chen et al. [6], etc. Our study suggested that EDS in PWE might be because of poor sleep quality which is in concordance with other studies in sleep by Chen et al., etc. The mean age at onset of illness was lower in our study and duration of illness was high which is comparable to other studies and old age cases had more sleep disorders when compared to young patients. 27% of our people had polytherapy as those patients were refractory epilepsies which was a limitation of this study to assess the individual effect of each drug. But this might help us to assess the effect of polytherapy on sleep. The increased sleep latency in this study may be due to the side effects of various AEDs and interaction of seizures with sleep. There is similar finding seen in Chen et al.

However in this study, the ESS in PWE significantly correlated with PSQI, suggesting that EDS in those cases was related to poor night time sleep quality. Bad sleep quality during night could lead to EDS and daytime dysfunction, which is found in other neurologic diseases like migraine, epilepsy, dementia, Parkinson's disorders, etc. Poor sleep hygiene also leads to sleep fragmentation, which can exacerbate seizures and EDS in PWE.

Age at onset and generalised seizure, were important variables that may contribute to reduced sleep quality and lead to EDS in PWE. These results were not comparable to study by Nai-Ching et al. Patients with generalised epilepsy were more susceptible to reduced sleep quality in our study.

CONCLUSION

83% of patients with epilepsy had sleep disorder. Poor night time sleep quality may lead to EDS and daytime dysfunction. Age at onset and generalised epilepsy were strongly associated with sleep disorders. These relationships have their implications in providing best management in sleep disturbances.

LIMITATIONS

The effects of specific drugs could not be determined from this study, because of insufficient number of cases; further studies are required to solve this issue.

REFERENCES

1. Piperidou C, Karlovasitou A, Triantafyllou N, et al. Influence of sleep disturbance on quality of life of patients with epilepsy. Seizure. 2008;17(October (7)):588–594.
2. Maganti R, Hausman N, Koehn M, Sandok E, Glurich I, Mukesh BN. Excessive daytime sleepiness and sleep complaints among children with epilepsy. Epilepsy Behav. 2006;8(February (1)):272–277.
3. Johns MW. A new method for measuring daytime sleepiness: the Epworth

sleepiness scale. Sleep. 1991;14 (December (6)):540–545.
4. Knutson KL, Rathouz PJ, Yan LL, Liu K, Lauderdale DS. Stability of the Pittsburgh Sleep Quality Index and the Epworth Sleepiness Questionnaires over 1 year in early middle-aged adults: the CARDIA study. Sleep. 2006;29 (November (11)):1503–1506.
5. Buysse DJ, Hall ML, Strollo PJ, et al. Relationships between the Pittsburgh Sleep Quality Index (PSQI), Epworth Sleepiness Scale (ESS), and clinical/polysomnographic measures in a community sample. J Clin Sleep Med. 2008;4 (December (6)):563–571.
6. Chen N-C, Tsai M-H, Chang C-C, et al. Sleep quality and daytime sleepiness in patients with epilepsy. Acta Neurol Taiwan. 2011;20(December (4)):249–256.