Section: Neurology

Original Research Article

ASSESSMENT OF SLEEP QUALITY IN PATIENTS WITH EPILEPSY

Subramanian R[1], Arvind Visweshwar[2], Manivannan MR[3]

[1]Assistant Professor of Neurology, Madurai medical college, Tamilnadu, India
[2]Resident in Neurology, Madurai medical college, Tamilnadu, India
[3]Professor of Neurology, Madurai medical college, Tamilnadu, India

Received : 13/01/2023
Received in revised form : 19/02/2023
Accepted : 05/03/2023

Keywords:
Epilepsy, Sleep disturbances, Pittsburg sleep quality index, Epileptic seizure.

Corresponding Author:
Dr. Subramanian R,
Email: rdmani1981@gmail.com

DOI: 10.47009/jamp.2023.5.2.247

Source of Support: Nil,
Conflict of Interest: None declared

Int J Acad Med Pharm
2023; 5 (2); 680-683

Abstract

Background: For both physical and mental wellness, sleep is essential. Regrettably, those with epilepsy frequently experience sleep problems. Therefore, assessing and treating sleep disorders is crucial to enhancing the quality of life. The study aims to evaluate the quality of sleep and related parameters in epilepsy patients receiving follow-up care at the department of neurology at Madurai Medical College. **Materials and Methods:** A case-control study was conducted at the neurology Outpatient department at Madurai medical college from March 2022 and May 2022. A total of 220 individuals were involved in the study, of whom 110 epileptic patients were chosen. One hundred ten patients were enrolled as healthy volunteers participating as the study controls. Pittsburgh Sleep Quality Questionnaire was used to measure sleep disruptions (PSQI). Questions about clinical state and sociodemographic traits were included in the questionnaire. **Result:** Thirty-five patients out of a total of 110 patients suffer generalized seizures, whereas 75 patients have focal seizures. Twenty-nine people have an idiopathic cause for their seizures, while around 81 patients have a symptomatic etiology. The research group's average PSQI score was 6.5. Patients with epilepsy reported significantly worse subjective sleep quality, longer sleep durations, and more nighttime sleep disruptions. Moreover, patients had a higher prevalence of daytime dysfunction than the control group. **Conclusion:** Seizures can harm both the quality and quantity of sleep, but antiepileptic medication (AEDs, VNS, or surgery) can have either a favourable or negative impact on sleep.

INTRODUCTION

An epileptic seizure is "a transitory manifestation of signs or symptoms related to abnormal excessive or synchronous neuronal activity in the brain," according to the International League against Epilepsy (ILAE). Epilepsy is philosophically defined as an "enduring predisposition of the brain to generate epileptic seizures, with neurobiological cognitive, psychological, and social implications".[1] Each year, epilepsy affects an estimated 5 million people worldwide. Epilepsy is thought to be diagnosed in 49 out of every 100,000 people annually in high-income countries. This number can reach 139 per 100 000 in low- and middle-income nations.[2] This is because endemic diseases like malaria and neurocysticercosis are more common, road traffic accidents and birth injuries are more common, and there are differences in the medical infrastructure, the availability of preventative health programs, and access to care. Almost 80% of people living with epilepsy reside in low- and middle-income nations.[3]

Sleep is a universal human need; inadequate sleep negatively affects people and society. Short-term health effects of lack of sleep include everything from mood problems and physical pain to increased stress reactivity and impairments in cognitive function. In the long term, inadequate sleep increases mortality from all causes, and specific health effects include hypertension, dyslipidemia, obesity, and cardiovascular disease.[4] Only 70–80% of seizures happen when you're sleeping. Juvenile Myoclonic Epilepsy is another sleep-related epilepsy that is frequently encountered in adolescents. At awakening, it typically begins with seizures and develops myoclonic jerks or generalized tonic-clonic seizures after an hour or two.[5] During sleep, the EEG displays a continuous spike-wave pattern linked to cognitive and psychological problems. Focal onset seizures are the most prevalent epilepsies that arise during sleep in adults.

The most frequent sorts of these seizures are frontal and temporal lobe seizures, with frontal lobe seizures traditionally being the most frequent epilepsy to arise out of sleep. Classical nocturnal

ISSN (O): 2687-5365; ISSN (P): 2753-6556

frontal lobe seizures are characterized by brief paroxysmal arousals accompanied by hyperkinetic and complicated motor motions. Interictally, the EEG is normal about 50% of the time and can even be normal during convulsions. In epilepsy monitoring units, sleep-related temporal lobe seizures account for one-third of all temporal lobe seizures.[6]

Patients who have trouble falling or staying asleep can benefit from benzodiazepines (BZDs), which may also have an anti-seizure effect. Non-BZD hypnotics like zolpidem and eszopiclone are faster and more effective at treating symptoms than BZDs.[7] If depression is the source of sleeplessness, antidepressants like trazodone may be helpful. However, tricyclic medications and selective serotonin reuptake inhibitors (SSRIs) have a significant risk of causing seizures, mainly when used in high dosages. Anti-seizure medications, such as gabapentin and pregabalin, can help people with focal epilepsy and insomnia sleep better, get more REM and slow-wave sleep and pay better attention throughout the day.[8]

MATERIALS AND METHODS

A case-control study was conducted at the neurology Outpatient department at Madurai medical college from March 2022 and May 2022.

The selection of study participants was made using systematic random sampling. The hospital treated 1000 epileptic patients in typical or average months. Two hundred twenty people were selected; of 220, 110 were epileptic patients and 110 healthy volunteers as control were selected.

The patients with epilepsy, ages between 18 and 50, and consent to participate in the study were the inclusion criteria.

BMI of more than 30, previous medical conditions such as DM/SHT/CAD/COPD, mental retardation, psychiatric illness, nocturnal epilepsy, use of sleep-altering medications, and pregnancy were among the exclusion criteria.

Dependent variable: sleep quality

Independent variables: Sociodemographic variables are age, sex, and clinically related factors, which are seizure types and mode of therapy.

Clinical assessment tool - PSQI (Pittsburgh Sleep Quality Questionnaire)

The PSQI was developed as a tool to assess sleep quality in 1989. It comprises 19 questions assessing the seven components of sleep, including subjective sleep quality, sleep latency, duration, habitual sleep efficiency, sleep disturbance, use of sleep medication, and daytime dysfunction. Seven component scores are produced for the PSQI, ranging from 0 (no difficulty) to 3. (Severe difficulty). The component scores are added together (range 0 to 21). Higher scores indicate poorer sleep quality to create the overall score.

For data analysis, SPSS for Windows, Version 13.0, was employed. All categorical data were presented using frequency, and all continuous measurements were summarized using Mean SD after assessing the normality assumption using the Shapiro-Wilk test. The unpaired t-test was used to compare the proportion disparities between the groups. To evaluate the relationship between the factors chi-square test was performed at a P value of 0.05, and values were considered statistically significant.

RESULTS

One hundred ten epileptic patients qualified for our study and were again split into a controlled and uncontrolled group. The control group was selected from those without a history of seizures. It could be compared by age and gender with epileptic patients.

Participants in the case and healthy control groups have mean ages and standard deviations of 36.82 ± 10.98, 40.58 ± 10.35, and 42.66 ± 1.3, respectively. In controlled groups, the average number of years with epilepsy is 12.7, compared to 12.48 in uncontrolled groups.

Table 1: The mean and SD for age and years of epilepsy

Profile	Case group (controlled) n=60			Case group (uncontrolled) n=50			Control group		
	Mean	SD	Range	Mean	SD	Range	Mean	SD	Range
Age	40.58	10.35	18-50	42.66	11.3	18-50	36.82	10.98	21-64
Years of epilepsy	12.7	1.04	11-15	12.48	1.07	11-15	-	-	-

There were 52 males and 58 females in the case group, compared to 56 males and 54 females in the control group. Only 35 patients out of a total of 110 patients suffer generalized seizures, whereas 75 patients have focal seizures. Twenty-nine people have an idiopathic cause for their seizures, while around 81 patients have a symptomatic etiology. Most of them underwent monotherapy, as seen in table 2. the chi-square test result shows an insignificant result between the case and control group with a p-value>0.05.

Table 2: Sociodemographic characteristics of the respondents.

Profile		Case group (controlled) n=60	Case group (uncontrolled) n=50	Total n=110	Control group n=110	P-value
Gender	Male	29	23	52	56	0.970
	Female	31	27	58	54	
Seizure type	Focal	41	34	75	-	0.97
	Generalized	19	16	35	-	

ISSN (O): 2687-5365; ISSN (P): 2753-6556

Etiology	Symptomatic	45	36	81	-	0.722
	Idiopathic	15	14	29	-	
Modes of therapy	Monotherapy	39	37	76	-	0.309
	Polytherapy	21	13	34	-	

According to the PSQI results, epileptic patients had worse sleep quality than the control group. The total score is 6.52 in the case group and 1.6 in the control group, and the p-value shows significant results between the group. The PSQI's various distinct subscales are displayed and compared in Table 3. Patients with epilepsy reported significantly worse subjective sleep quality, longer sleep durations, and more nighttime sleep disruptions. Moreover, patients had a higher prevalence of daytime dysfunction than the control group.

Table 3: PSQI score values in both groups

PSQI	Case group N=110			Control group n=110			P-value
	Mean	SD	median	Mean	SD	median	
Sleep Quality	1.36	0.499	1	0.49	0.55	0	0.0001
Sleep latency	1.6	0.49	2	0.46	0.55	0	0.0001
Sleep duration	0.45	0.50	0	0.23	0.42	0	0.042
Sleep efficiency	1.12	0.79	1	0.19	0.39	0	0.0001
Sleep disturbance	1.5	0.76	1	0.08	0.27	0	0.0001
Medication use	0.28	0.43	0	0.11	0.34	0	0.68
Day time dysfunction	0.25	0.41	0	0.063	0.24	0	0.19
Total score	6.52	1.61	7	1.6	1.22	2	0.0001

Characteristics	Our study	Yazdi Z et al.[11]	Staniszewska A et al.[12]	Chen NC et al.[13]
Years of epilepsy	the average number of years with epilepsy is 12.7	The average number of years with seizures was 5.3.	The average number of months with epilepsy was 197.9 months.	The duration of epilepsy in this study ranged from 0.42 to 47 years.
Seizure type	Only 35 patients out of a total of 110 patients suffer generalized seizures, whereas 75 patients have focal seizures.	98 (64.5%) of the 152 epileptic individuals had focal epilepsy, while 54 (35.5%) had generalized epilepsy.	Two hundred twelve patients had generalized epilepsy. Only 90 patients had focal seizures	Of over 147 samples, Twenty patients (18%) had generalized epilepsy, 96 had focal epilepsy (82%), and 66 were reported to be seizure-free.
Etiology	Just 29 people have an idiopathic cause for their seizures, while around 81 patients have a symptomatic etiology.	Nil	Nil	Regarding etiology, 62 patients (53%) had symptomatic epilepsy, and 55 (47%) had idiopathic/cryptogenic epilepsy.
Modes of therapy	Most of the epileptic patients underwent monotherapy, whereas only 34 patients had polytherapy	86.8% of epileptic patients received polytherapy; 13.1% received monotherapy.	According to a medication analysis, 53.3% of the patients received monotherapy. 43.7% received polytherapy, and 3.3% received no medications.	Forty-nine patients (42%) underwent monotherapy, whereas 68 (58%) received polytherapy.
PQSI score analysis	Patients with epilepsy reported significantly worse subjective sleep quality, longer sleep durations, and more nighttime sleep disruptions.	Poor sleep quality was more prevalent in epileptic patients than in the control group, according to the PSQI results.	Most patients who took the PSQI examination had poor sleep quality.	The PSQI overall score and the PSQI subscales of sleep efficiency, latency, duration, and quality were considerably lower in the sick group than in the control group.

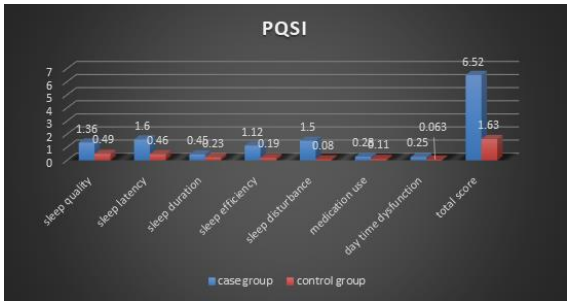

Figure 1: The PQSI values between the case and control group.

DISCUSSION

This study's primary objective was to examine the occurrence of sleep abnormalities in epilepsy patients and compare it to that of healthy, non-epilepsy volunteers. The results showed that epileptic patients had higher rates of excessive daytime sleepiness and trouble maintaining sleep than the control group. According to the results, Our study includes the age group between 18 and 50. The study by Piperidou et al.[9] had a mean age of 35.4, ranging from 18 to 70. There were 52 males and 58 females in the case group, compared to 56 males and 54 females in the control group. Sixty men and 39 women made up the study population for Giorelli AS et al.[10]

ISSN (O): 2687-5365; ISSN (P): 2753-6556

We looked at the impact of age, gender, and clinical characteristics on sleep issues, including duration of epilepsy, kind of seizure, etiology, and the type and kind of therapy. In all instances, $P > 0.05$, this study found no association between the case and control groups. The patient group also had substantially worse sleep quality, latency, sleep duration, efficiency, and sleep disturbance (all $p < 0.05$).

CONCLUSION

Those who also have comorbid sleep problems may have difficulty managing their epilepsy. Sleep abnormalities, including sleep-disordered breathing, should be treated, which may help with seizure management. Seizures can harm both the quality and quantity of sleep, but antiepileptic medication (AEDs, VNS, or surgery) can have either a favourable or negative impact on sleep. As a result, asking about sleep quality and screening, evaluating, and treating sleep disturbances must be part of therapy for epileptic patients.

REFERENCES

1. Fisher RS, van Emde Boas W, Blume W, Elger C, Genton P, Lee P, et al. Epileptic seizures and epilepsy: definitions proposed by the International League Against Epilepsy (ILAE) and the International Bureau for Epilepsy (IBE). Epilepsia 2005; 46:470–2.
2. Radhakrishnan K. Challenges in the management of epilepsy in resource-poor countries. Nat Rev Neurol 2009; 5:323–30.
3. Newton CR, Garcia HH. Epilepsy in poor regions of the world. Lancet 2012; 380:1193–201.
4. Durmer JS, Dinges DF. Neurocognitive consequences of sleep deprivation. Semin Neurol 2005; 25:117–29.
5. Kothare SV, Kaleyias J. Sleep and epilepsy in children and adolescents. Sleep Med 2010; 11:674–85.
6. Bazil CW, Walczak TS. Effects of sleep and sleep stage on epileptic and nonepileptic seizures. Epilepsia 1997; 38:56–62.
7. Xu X, Brandenburg NA, McDermott AM, Bazil CW. Sleep disturbances reported by refractory partial-onset epilepsy patients receiving polytherapy. Epilepsia 2006; 47:1176–83.
8. Moore JL, Carvalho DZ, St Louis EK, Bazil C. Sleep and epilepsy: A focused review of pathophysiology, clinical syndromes, co-morbidities, and therapy. Neurotherapeutics 2021; 18:170–80.
9. Piperidou C, Karlovasitou A, Triantafyllou N, Terzoudi A, Constantinidis T, Vadikolias K, et al. Influence of sleep disturbance on quality of life of patients with epilepsy. Seizure 2008; 17:588–94.
10. Giorelli AS, Neves GS de ML, Venturi M, Pontes IM, Valois A, Gomes M da M. Excessive daytime sleepiness in patients with epilepsy: a subjective evaluation. Epilepsy Behav 2011; 21:449–52.
11. Yazdi Z, Sadeghniiat-Haghighi K, Naimian S, Zohal MA, Ghaniri M. Prevalence of sleep disorders and their effects on sleep quality in epileptic patients. Basic Clin Neurosci 2013; 4:36–41.
12. Staniszewska A, Mąka A, Religioni U, Olejniczak D. Sleep disturbances among patients with epilepsy. Neuropsychiatr Dis Treat 2017; 13:1797–803.
13. Chen N-C, Tsai M-H, Chang C-C, Lu C-H, Chang W-N, Lai S-L, et al. Sleep quality and daytime sleepiness in patients with epilepsy. Acta Neurol Taiwan 2011; 20:249–56.

ISSN (O): 2687-5365; ISSN (P): 2753-6556