



Magnitude and Types of Psychiatric Comorbidity in Patients with Idiopathic Generalized Tonic-Clonic Seizures and Temporal Lobe Epilepsy: A comparative study

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Abstract

Background: Individuals with epilepsy are known to have an increased risk for psychiatric disorders (PD). This study aimed to investigate the frequency of PD and potential differences in psychiatric diagnosis between two major epileptic syndromes: Idiopathic generalized tonic-clonic seizure (GTCS) and Temporal lobe epilepsy (TLE).

Methods: We compared clinical data from 50 consecutive patients with GTCS and 50 patients with TLE who had been clinically diagnosed by Neurologists. We compared the frequencies of different PD diagnoses between the two groups.

Results: Both groups exhibited a high prevalence of PD, with 24 GTCS patients (48%) and 29 TLE patients (58%) presenting with at least one PD diagnosis. Depression (20%), anxiety disorders (16%), bipolar disorder (8%), and schizophrenia (6%) were the most frequent PD diagnoses in the TLE group, whereas depression and anxiety disorders (28% and 16%, respectively) were the most common diagnoses in the GTCS group. The TLE group showed a statistically significant association with psychotic disorders.

Conclusion: Our study reveals a high magnitude of PD in both the GTCS and TLE groups, indicating a need for closer attention to psychiatric comorbidities in patients with epilepsy. The significant association between TLE and psychotic disorders suggests a potential bidirectional link between epilepsy and PD. Future research could explore the underlying mechanisms of this link and examine potential implications for clinical practice

Keywords: GTCS, TLE, Epilepsy, Psychiatric- Comorbidity, Comparison

Introduction

Accounting for 0.5% of the global burden of disease, epilepsy affects approximately 0.5%-1.5% of the world's population, with a majority of patients residing in low and middle-income countries. India alone accounts for one-sixth of the global epileptic patient population.⁽¹⁻³⁾ The prevalence of generalized tonic-clonic seizure (GTCS) is 4-8/1000 per population⁽⁶⁾ and the prevalence of temporal lobe epilepsy (TLE) is around 0.51-0.66/per 1000 per population.⁽⁷⁾

Psychiatric comorbidity is a common occurrence among patients with epilepsy, with prevalence rates ranging from 20-50%.⁽⁸⁻¹²⁾ According to recent studies, idiopathic GTCS has been associated with a

higher proportion of psychiatric comorbidity. However, TLE is the most frequently associated epilepsy type with psychiatric comorbidity.⁽¹³⁾

Despite the existing research, few studies have compared the prevalence and types of psychiatric comorbidity between different types of epilepsy.^(14, 15) To address this gap in the literature, this study aims to compare the magnitude and types of psychiatric comorbidity among patients with idiopathic GTCS and TLE. By identifying the epilepsy type that is more prone to psychiatric comorbidity, this study can contribute to the development of better management and treatment

strategies for patients with epilepsy and psychiatric comorbidities.

Materials And Method:

Study Design And Setting:

This study is a hospital-based cross-sectional comparative study conducted at the neurology department of a tertiary care hospital attached to a medical College in Jaipur (Rajasthan) India. The study was conducted from January 2019 to June 2020.

Participants:

The study included stable patients who had been previously diagnosed with temporal lobe epilepsy (TLE) or idiopathic generalized tonic-clonic seizures (GTCS) and were attending the neurology department during the specified study time period. Convenience sampling was used to include 50 patients with TLE and 50 patients with idiopathic GTCS. The inclusion criteria were the presence of electroclinical diagnosis of TLE or GTCS based on ILAE classification, having been treated in the department of neurology for at least one year, and having no epileptic episode in the past 6 months. Patients who were not willing to give consent, had existing psychiatric illness before the onset of epilepsy, or had other medical comorbidity were excluded from the study. All the tools and inclusion and exclusion criteria were applied by a consultant psychiatrist and assisted by a resident doctor.

Ethical Considerations:

The study proposal was approved by the Institutional ethical committee. Informed written consent was obtained from all participants before the study. The confidentiality of participants was maintained throughout the study, and the data were used only for research purposes.

Data Collection:

Clinical and socio-demographic data from participants were reviewed. Screening of comorbid psychiatric illness was done by applying the General

Health questionnaire (GHQ-12) Hindi Version⁽¹⁶⁾ and Brief Psychiatric Rating scale.^(17,18) Patients who scored > 2 on GHQ-12 or > 31 on the BPRS scale were further assessed by the same psychiatrist through the ICD-10 symptom checklist, which is a semi-structured diagnostic instrument for the assessment of F0-F6 categories in the ICD-10 classification. The ICD-10 Symptom Checklist is a valid instrument for assessing symptoms of mental disorders based on the International Classification of Diseases, Tenth Revision (ICD-10). It has been used in various studies and has shown good reliability and validity for identifying symptoms of mental disorders across different populations and settings.⁽¹⁹⁾

Data Analysis:

The data were compiled and analyzed using IBM SPSS 27 Version.⁽²⁰⁾ A Chi-square test was performed to find out the association between qualitative data in both groups, and an unpaired t-test was applied to find out the association between quantitative data in both groups. A p-value of <0.05 was considered significant.

Results:

Participant Characteristics:

The study included 50 patients with GTCS and 50 patients with TLE. The mean age was 32.42±11.58 years for GTCS patients and 34.42±9.72 years for TLE patients. Both groups had a majority of male participants (GTCS: 52%, TLE: 58%) who identified as Hindu (GTCS: 76%, TLE: 70%) and lived in urban areas (GTCS: 54%, TLE: 52%). The majority of participants in both groups were married (GTCS: 64%, TLE: 76%) and lived in nuclear families (GTCS: 58%, TLE: 62%). A similar percentage of participants in both groups were uneducated (GTCS: 50%, TLE: 46%). Overall, the demographic characteristics of the two groups were relatively similar, with the exception of income. There was a statistically significant difference between the two groups in the monthly income variable, with TLE patients reporting a significantly lower income than GTCS patients (p<0.05). (Table: 1).

Table:1 Distribution of sample according to socio-demographic profile.

Variables	GTCS	TLE	P-Value
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Age			
18-30 years	26(52%)	20(40%)	0.19
31-40 years	14(28%)	18(36%)	
41-50 years	5(10%)	9(18%)	
51-60 years	5(10%)	3(6%)	
Sex			
Male	26(52%)	29(58%)	0.31
Female	24(48%)	21(42%)	
Religion			
Hindu	38(76%)	35(70%)	0.79
Muslim	9(18%)	11(22%)	
Christian	3(6%)	4(8%)	
Domicile			
Rural	23(46%)	24(48%)	0.84
Urban	27(54%)	26(52%)	
Education			
Uneducated	25(50%)	23(46%)	0.80
Primary	9(18%)	6(12%)	
Secondary	7(14%)	11(22%)	
Sr Secondary	7(14%)	8(16%)	
Graduation	2(4%)	2(4%)	

Occupation			
Unemployed	3(6%)		
Laborer	14(28%)	7(14%)	
Farmer	9(18%)	18(36%)	
Housewife	14(28%)	9(18%)	
Student	5(10%)	6(12%)	
Service	2(4%)	5(10%)	0.14
Shopkeeper	3(6%)	5(10%)	
		0(0%)	
Relationship status			
Married	32(64%)	38(76%)	
Unmarried	15(30%)	11(22%)	
Widow	2(4%)	1(2%)	0.93
Divorce	1(2%)	0(0%)	
Type of Family			
Nuclear	29(58%)	31(62%)	
Joint	21(42%)	19(38%)	0.98
Family income(monthly)			
<5000 INR	11(22%)	20(40%)	
5001-10000 INR	5(10%)	15(30%)	

10001-20000 INR	3(6%)	13(26%)	0.00001*
20001-30000 INR	28(56%)	1(2%)	
>30000 INR	3(6%)	1(2%)	

Table 2 Clinical Data of the sample population.

Variables	GTCS	TLE	P-value
Age of onset of epilepsy			
<18 years	11(22%)	6(12%)	0.001*
18-30 years	26(52%)	16(32%)	
31-40 years	11(22%)	22(44%)	
41-50 years	2(4%)	6(12%)	
Duration of illness			
<5 years	30 (60%)	39(78%)	0.06
>5 years	20(40%)	11 (22%)	
Number of Drugs			
Monotherapy	22(44%)	12(24%)	0.21
Polytherapy	28(56%)	38(76%)	

Controlled /uncontrolled seizure			
Controlled	46(92%)	49(98%)	0.59
Uncontrolled	4(8%)	1(2%)	

Clinical Characteristics:

The two groups were comparable in terms of duration of illness, number of drugs, and controlled/uncontrolled seizures. However, there was a statistically significant difference in the mean age of onset of epilepsy between the two groups. The majority of GTCS patients (n=26, 52%) belonged to the 18-30-year age group, while the majority of TLE patients (n=22, 44%) belonged to the 30-40-year age group. The difference in age of onset of epilepsy between the two groups was statistically significant (p<0.05). (Table:2)

There was a statistically significant difference between the GTCS and TLE groups in terms of psychiatric comorbidity. A higher proportion of TLE patients (58%) scored above the cut-off score of 2 on the GHQ-12 Hindi version scale compared to the

GTCS group (48%). In addition, 10% of TLE patients scored >31 on the BPRS scale, indicating the presence of psychotic disorders, while none of the GTCS patients scored above the cut-off. (Table 3,4, Figure 1,2)

Further assessment by the consultant psychiatrist revealed that 28% of the GTCS patients suffered from depression, followed by panic disorder (10%) and generalized anxiety disorder (10%). In contrast, 20% of TLE patients were diagnosed with depression, followed by generalized anxiety disorder (10%), panic disorder (6%), bipolar affective disorder current episode mania (6%), schizophrenia (6%), acute transient psychotic disorder (4%), obsessive-compulsive disorder (4%), and bipolar affective disorder current episode depression (2%). (Table:4, figure-3)

Table 3: Psychiatric comorbidity in GTCS and TLE patients.

Psychiatric comorbidity	GTCS (n=50, %)	TLE (n=50,%)	p-value (Unpaired t-test)
GHQ-12 Score > 02	24 (48%)	29 (58%)	0.02
BPRS Score > 31	00 (00%)	05 (10%)	0.03

Figure: 1 Psychiatric comorbidity in GTCS and TLE. (GHQ Score > 2)

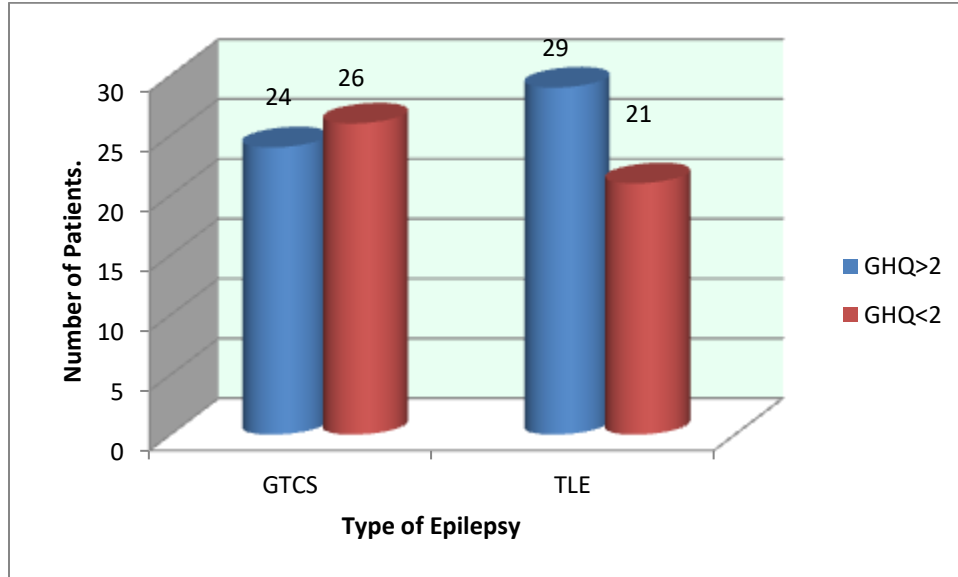


Fig 2: Psychotic disorder in GTCS and TLE (BPRS Score > 31)

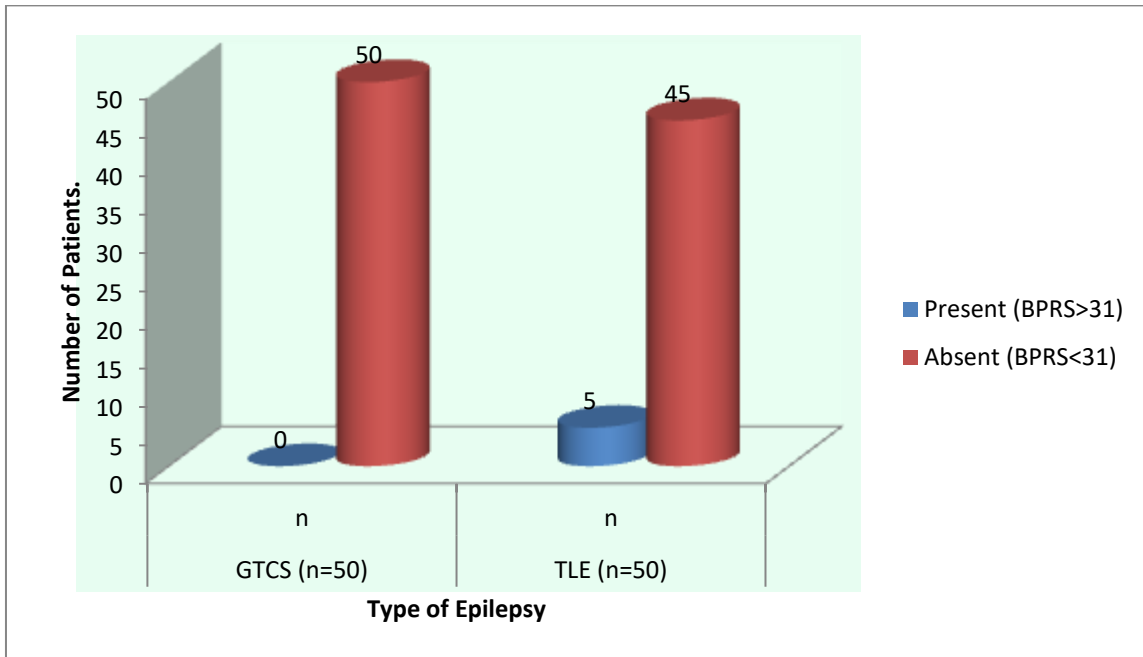
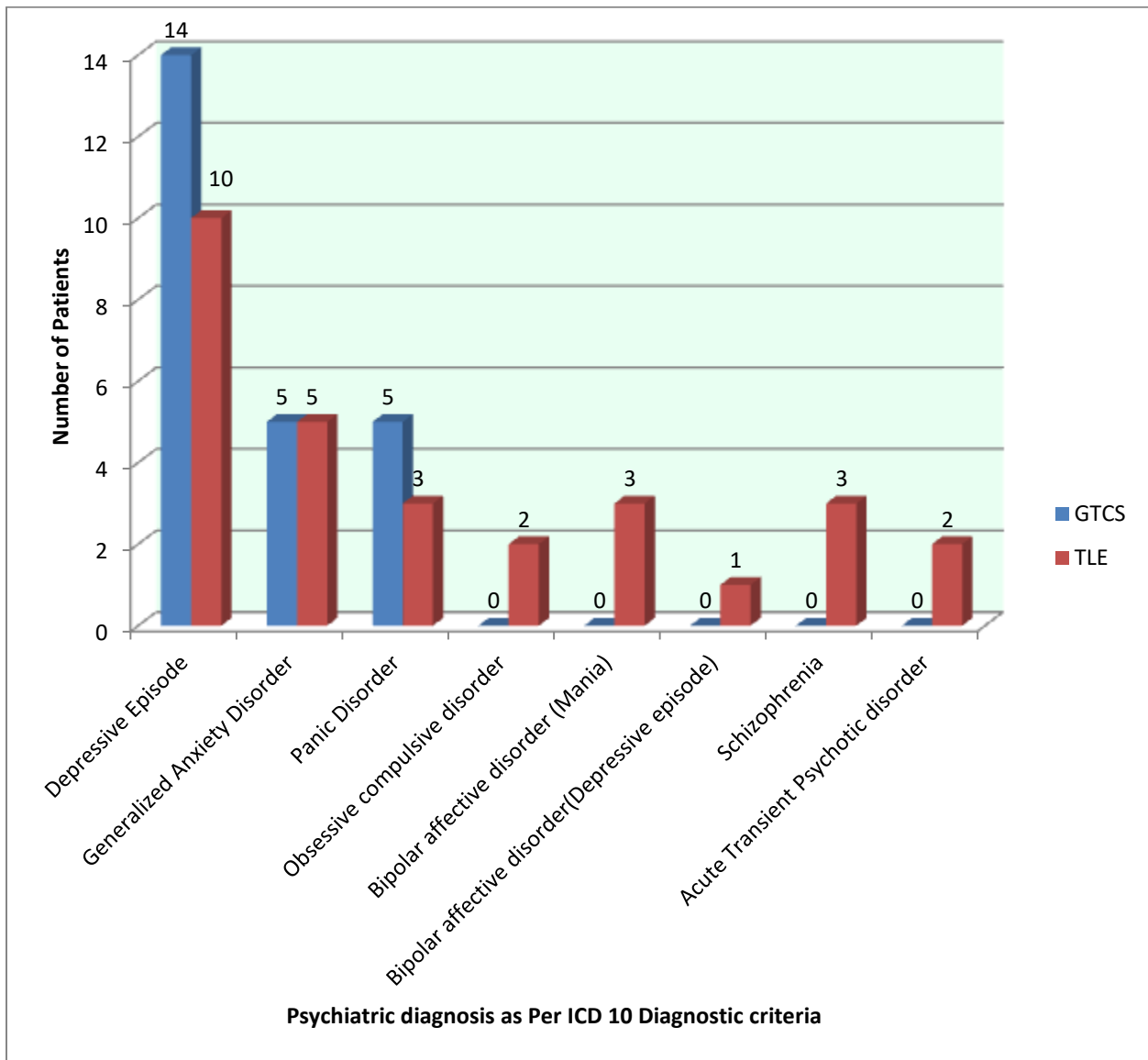


Table:4 Psychiatric diagnosis as per ICD 10 Diagnostic criteria. (ICD -10 Symptoms Check List)

ICD-10 Diagnosis	GTCS Patients (n=24/50)		Temporal Lobe epilepsy Patients (n=29/50)	
	Number	%	Number	%
Depressive Episode	14	28%	10	20%
Generalized Anxiety Disorder	5	10%	5	10%

Panic Disorder	5	10%	3	6%
Obsessive compulsive disorder	0	0	2	4%
Bipolar affective disorder (Mania)	0	0	3	6%
Bipolar affective disorder (Depressive episode)	0	0	1	2%
Schizophrenia	0	0	3	6%
Acute Transient Psychotic disorder	0	0	2	4%
Total	24/50	48/100	29/50	58/100

Figure: 3 Psychiatric comorbidities in GTCS and TLE patients



Discussion

Psychiatric comorbidities are frequently observed in individuals with epilepsy and may arise due to shared pathophysiological, genetic, psychological, and iatrogenic mechanisms. However, accurately estimating and comparing the prevalence of psychiatric comorbidities across different types of epilepsy can be challenging due to various factors such as the type of study, chronicity of disease, methodology, and population settings.^(15,21) To the best of our knowledge, till now, very few studies have specifically compared the prevalence of psychiatric comorbidities between individuals with idiopathic generalized tonic-clonic seizures and those with temporal lobe epilepsy.

In this study, no statistically significant differences were found between GTCS and TLE patients in terms of socio-demographic variables, except for income, which was higher in GTCS patients. This may be due to the higher prevalence of psychiatric comorbidities in TLE patients, potentially affecting their ability to maintain high-paying jobs. A previous study reported a link between psychiatric comorbidities and lower income levels, supporting this finding.⁽²²⁾

Previous studies have suggested that the age of onset for TLE may be higher compared to GTCS. This may be due to a delay in diagnosing TLE, as the seizures can be mistaken for psychiatric disorders and go undiagnosed for a longer period.^(7,23) We also observed a higher age of onset for TLE patients compared to GTCS patients. Apart from the difference in age of onset, we did not observe any statistically significant differences between the two groups in terms of the duration of illness or the number of antiepileptic drugs used.

Epilepsy patients commonly face challenges related to their illness or comorbid psychiatric conditions. Studies have reported varying rates of psychiatric comorbidities in patients with generalized tonic-clonic seizures (GTCS) and temporal lobe epilepsy (TLE). For instance, previous research by Ertem *et al* showed that around 57% of TLE patients had psychiatric comorbidities, while Tellez *et al* found that more than 40% of GTCS patients had a comorbid psychiatric disorder.^(24,25) Our study results were consistent with these findings, with 48% of GTCS patients and 58% of TLE patients having comorbid psychiatric conditions. However, it's worth

noting that these rates can differ depending on factors such as population and methodology. For example, an Indian study on 200 epileptic patients found that the prevalence of psychiatric comorbidities was 24.33% in GTCS patients and 36.36% in focal seizures.⁽¹⁴⁾ These differences could be attributed to variations in the study population, diagnostic criteria, and methodology.

Our study findings were in line with previous research on psychiatric comorbidity patterns in patients with epilepsy.^(15,25-27) Specifically, our results showed that depression was the most common comorbid condition in both the GTCS and TLE groups, which is consistent with previous studies.^(25,28-30)

Anxiety disorders, including generalized anxiety disorder and panic disorder, were also prevalent in both the GTCS and TLE groups. Specifically, 20% of GTCS patients and 16% of TLE patients were diagnosed with anxiety disorders. These findings are in agreement with the results of a previous study conducted by Vujisic *et al*, which found that 21% of epileptic patients suffered from anxiety, with a higher prevalence in GTCS patients.⁽²¹⁾

Previous studies have reported a higher prevalence of OCD in TLE patients.^(26, 31) Similarly, we found that none of the GTCS patients were diagnosed with OCD, while 4% of TLE patients had OCD.

The literature on bipolar disorder in epilepsy is scarce, and most of the studies evaluating mood disorders in epilepsy focus on depression. In our study, none of the GTCS patients had bipolar disorder, while 8% of TLE patients were diagnosed with bipolar disorder. These findings are in line with another study conducted by Oliviera GM *et al* on 73 TLE patients, which reported a 10% prevalence of bipolar disorder in TLE patients.⁽³²⁾

Interestingly, none of the GTCS patients in our study was diagnosed with a psychotic spectrum disorder, whereas 10% of TLE patients had a diagnosis of psychosis. This finding is consistent with Clancy JM *et al*'s meta-analysis, which found a higher prevalence of psychosis in TLE (7%) than in generalized epilepsy (5.6%).⁽³³⁾

Overall, our study highlights the importance of screening for psychiatric comorbidities in both GTCS and TLE patients. Clinicians should be aware of the

higher prevalence of specific psychiatric comorbidities in TLE patients, such as OCD, bipolar disorder, and psychosis, and tailor their treatment plans accordingly.

Limitations:

This study has some limitations that need to be considered when interpreting the results. Firstly, the sample size was relatively small, with only 50 patients with TLE and 50 patients with idiopathic GTCS included in the study. This may limit the generalizability of the findings to larger populations of patients with epilepsy. Secondly, the study relied on convenience sampling, which may introduce selection bias and limit the representativeness of the sample. Additionally, the study design was cross-sectional, which means that it is not possible to establish cause-and-effect relationships between the variables. Furthermore, the study relied on self-report measures to assess comorbid psychiatric illness, which may be subject to recall bias and social desirability bias. Finally, the study was conducted at a single hospital, which may limit the generalizability of the findings to other settings.

Conclusion:

Despite limitations, this study underscores the high magnitude of psychiatric comorbidities in individuals with epilepsy. Temporal lobe epilepsy patients had a higher prevalence of certain psychiatric comorbidities, highlighting the need for tailored treatment plans. Screening for psychiatric comorbidities in both types of epilepsy is crucial for improved treatment outcomes. Further research is necessary to explore the relationship between epilepsy and psychiatric comorbidities.

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