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PSYCHOGENIC NONEPILEPTIC SEIZURES (PNES) VERSUS TRUE EPILEPSY: CLINICAL CHARACTERISTICS AND DIAGNOSTIC CHALLENGES.

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ABSTRACT

Objective: This study aims to differentiate the clinical characteristics and diagnostic challenges of Psychogenic Nonepileptic Seizures (PNES) from true epilepsy in adult patients. An accurate diagnosis is critical to avoid unnecessary treatments and optimize patient management.

Methods: A cross-sectional study was conducted on 80 adult patients presenting with seizure-like episodes at the Department of Neurology, Batra Hospital & Medical Research Centre, New Delhi. Detailed clinical evaluations, neuroimaging (MRI, CT), Electroencephalography (EEG), and Video EEG (VEEG) monitoring were performed. Patients were classified into PNES and true epilepsy groups, and statistical analyses were conducted to identify distinguishing features and diagnostic challenges.

Results: Among the 80 patients, 35 were diagnosed with PNES, while 45 were diagnosed with true epilepsy. Key distinguishing features included the nature of seizure onset, duration, motor phenomena, and triggers. MRI and EEG findings showed significant differences between the two groups, with PNES patients often having normal neuroimaging and non-specific EEG changes. Diagnostic challenges were identified in overlapping clinical features, emphasizing the need for comprehensive diagnostic approaches.

Conclusion: This study highlights the clinical differences and diagnostic challenges in distinguishing PNES from true epilepsy. A thorough evaluation incorporating clinical, neuroimaging, and VEEG data is essential to prevent misdiagnosis and ensure appropriate management.

Key words: PNES, True Epilepsy, EEG, Diagnostic Challenges, Seizure Disorders.

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Introduction

Psychogenic Nonepileptic Seizures (PNES) are events that resemble epileptic seizures but are not associated with abnormal electrical discharges in the brain. Instead, they are manifestations of psychological distress or psychiatric conditions (1). PNES is often misdiagnosed as true epilepsy due to the similarity in clinical presentation, leading to inappropriate antiepileptic treatment, increased healthcare costs, and poor quality of life (2). The estimated prevalence of PNES among patients presenting with seizure-like episodes to epilepsy centers ranges from 20% to 30% (3).

True epilepsy is characterized by recurrent, unprovoked seizures due to abnormal electrical activity in the brain (4). Differentiating PNES from true epilepsy is challenging and requires a comprehensive diagnostic approach, including a detailed clinical history, neuroimaging, and Electroencephalography (EEG) or Video EEG (VEEG) monitoring (5). Neuroimaging and EEG findings can be normal in PNES, while true epilepsy typically shows specific abnormalities that correlate with seizure type and localization (6,7).

Despite the availability of advanced diagnostic techniques, there remains a significant overlap in clinical presentations between PNES and true epilepsy, contributing to diagnostic confusion and inappropriate treatment. This study aims to analyze and differentiate the clinical characteristics and diagnostic challenges of PNES versus true epilepsy in a tertiary care setting. Identifying key clinical and diagnostic markers can aid clinicians in accurately diagnosing and managing these conditions.

Methods

Study Design and Population

This cross-sectional study was conducted at the Department of Neurology, Batra Hospital & Medical Research Centre, New Delhi. The study included 80 adult patients (>18 years) presenting with seizure-like episodes between January 2022 and December 2023. Patients were classified into PNES (n=35) and true epilepsy (n=45) groups based on clinical evaluation, neuroimaging, and EEG/VEEG findings.

Inclusion and Exclusion Criteria

Patients included were those with recurrent seizure-like episodes who underwent comprehensive diagnostic evaluations. Patients with acute symptomatic seizures, metabolic disturbances, or other identifiable causes for seizures were excluded.

Data Collection (Clinical Evaluation, Neuroimaging, and EEG/VEEG Monitoring)

Demographic data, seizure history (onset, duration, triggers), and neurological examinations were documented. Neuroimaging evaluations included MRI and CT scans to detect structural abnormalities. EEG and VEEG monitoring were performed to classify events as epileptic or non-epileptic. EEG findings were categorized as normal, focal epileptiform discharges, generalized discharges, or non-specific changes.

Statistical Analysis

Data were analyzed using SPSS version 26.0. Descriptive statistics were used to summarize

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demographic and clinical characteristics. Chi-square and Fisher's exact tests were employed to evaluate associations between PNES and true epilepsy with clinical, neuroimaging, and EEG findings. A p-value of <0.05 was considered statistically significant.

Results

Demographics and Clinical Characteristics of PNES vs. True Epilepsy

Among the 80 patients included in the study, the mean age was 38.4 ± 14.7 years. The PNES group had a higher female predominance (80%) compared to the true epilepsy group (60%), which was statistically significant (p = 0.03) (Table 1). PNES patients were more likely to have seizure episodes with gradual onset, prolonged duration (>5 minutes), and absence of postictal confusion, which contrasted with the abrupt onset, shorter duration (<2 minutes), and presence of postictal confusion in true epilepsy patients.

Neuroimaging Findings (MRI, CT)

Neuroimaging findings were normal in 85% of PNES patients, while structural abnormalities were detected in 60% of true epilepsy patients (Table 2). MRI findings in the true epilepsy group included mesial temporal sclerosis (15%), cortical dysplasias (10%), and cerebrovascular lesions (8%). In contrast, PNES patients had no significant findings on MRI or CT, suggesting the absence of structural brain pathology.

Electroencephalographic Findings (EEG) and Video EEG (VEEG) Monitoring

EEG abnormalities were found in 75% of true epilepsy patients, with focal epileptiform discharges (40%) being the most common finding, followed by generalized discharges (25%) (Table 3). In the PNES group, EEG findings were mostly normal (70%), with some patients showing non-specific slow-wave changes (30%). VEEG monitoring played a critical role in distinguishing PNES from true epilepsy by capturing events without associated EEG changes in PNES patients, providing conclusive evidence of non-epileptic episodes.

Diagnostic Challenges and Correlations

Despite the use of advanced neuroimaging and EEG/VEEG, several diagnostic challenges were identified due to overlapping clinical features, such as seizure frequency, motor phenomena, and triggers. A combination of detailed history, clinical examination, and VEEG monitoring was essential to achieve a definitive diagnosis and prevent misdiagnosis (Figure 1).

Tables and Graphs

Table 1: Demographics and Clinical Characteristics of PNES vs. True Epilepsy

Characteristic	PNES (n=35)	True Epilepsy (n=45)	p-value
Mean Age (years)	37.2 ± 15.1	39.5 ± 14.3	0.42
Female (%)	28 (80.0%)	27 (60.0%)	0.03*
Seizure Onset (Gradual) (%)	30 (85.7%)	5 (11.1%)	<0.001*

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Characteristic	PNES (n=35)	True Epilepsy (n=45)	p-value
Seizure Duration (>5 mins) (%)	25 (71.4%)	2 (4.4%)	<0.001*
Postictal Confusion (%)	2 (5.7%)	30 (66.7%)	<0.001*

*p-value significant at <0.05

Table 2: Neuroimaging Findings in PNES vs. True Epilepsy

Neuroimaging Findings	PNES (n=35)	True Epilepsy (n=45)	p-value
Normal MRI (%)	30 (85.7%)	18 (40.0%)	<0.001*
Mesial Temporal Sclerosis (MTS) (%)	0 (0.0%)	7 (15.6%)	0.01*
Cortical Dysplasias (%)	0 (0.0%)	4 (8.9%)	0.08
Cerebrovascular Lesions (%)	1 (2.9%)	3 (6.7%)	0.42
Other Abnormalities (%)	2 (5.7%)	2 (4.4%)	0.81
Normal CT (%)	32 (91.4%)	20 (44.4%)	<0.001*

*p-value significant at <0.05

Table 3: EEG Findings in PNES vs. True Epilepsy

EEG Findings	PNES (n=35)	True Epilepsy (n=45)	p-value
Normal EEG (%)	25 (71.4%)	5 (11.1%)	<0.001*
Focal Epileptiform Discharges (%)	0 (0.0%)	18 (40.0%)	<0.001*
Generalized Epileptiform Discharges (%)	0 (0.0%)	11 (24.4%)	<0.001*
Non-specific Slow-Wave Changes (%)	10 (28.6%)	11 (24.4%)	0.68
Abnormal EEG without Epileptiform Activity (%)	0 (0.0%)	3 (6.7%)	0.26

*p-value significant at <0.05

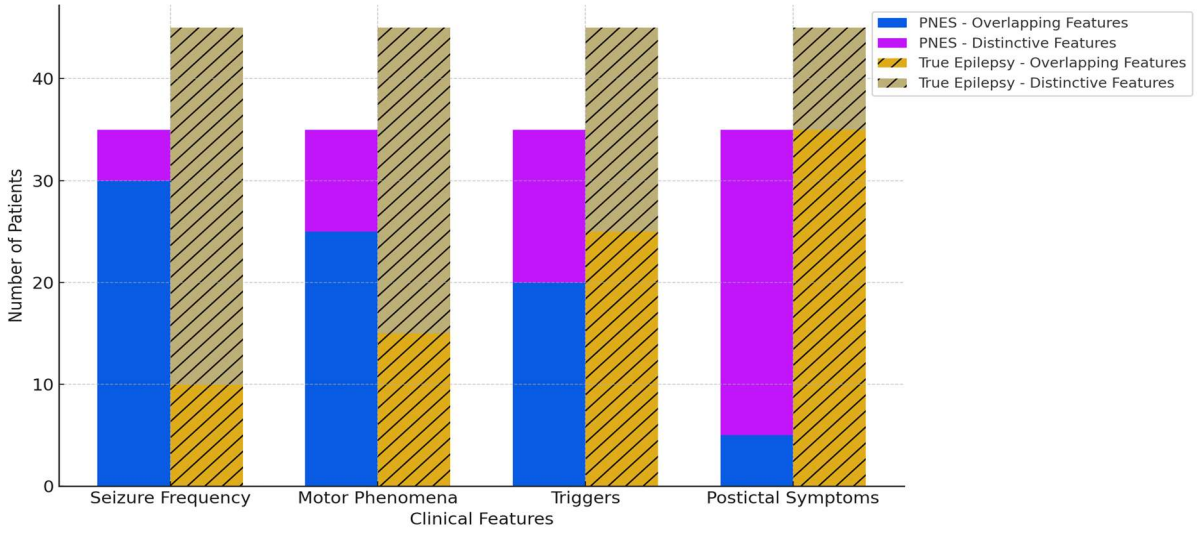

Figure 1: Diagnostic Challenges in Differentiating PNES from True Epilepsy

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This graph shows the distribution of overlapping clinical features (such as seizure frequency, motor phenomena, triggers, and postictal symptoms) among PNES and true epilepsy patients. It highlights the diagnostic challenges due to similarities in the clinical presentation of both groups, which often complicates accurate diagnosis.

Discussion

Interpretation of Key Findings

This study highlights the critical differences in clinical characteristics and diagnostic challenges between Psychogenic Nonepileptic Seizures (PNES) and true epilepsy. PNES was predominantly observed in females, with a gradual onset, longer duration of seizures, and absence of postictal confusion, which aligns with previous findings that suggest PNES often presents with psychological or stress-related triggers and features that differ from those of true epilepsy (1,8). In contrast, true epilepsy was characterized by more abrupt onset, shorter duration, and clear postictal confusion, which are hallmark features of epileptic seizures (4,9).

Comparison with Previous Studies

Our results show that neuroimaging (MRI and CT) findings are mostly normal in PNES patients (85.7%), whereas true epilepsy patients had a higher prevalence of mesial temporal sclerosis (15.6%), cortical dysplasias (8.9%), and other structural abnormalities (10). These findings are consistent with the literature that emphasizes the absence of structural pathology in PNES and the utility of MRI in identifying epilepsy-related abnormalities (6,10). Similarly, EEG and Video EEG (VEEG) were crucial in distinguishing PNES from true epilepsy, with focal or generalized epileptiform discharges being significantly more common in true epilepsy patients (11).

The overlapping clinical features, such as seizure frequency, motor phenomena, and triggers, present significant diagnostic challenges. Our data indicate that a combination of detailed clinical history, neuroimaging, and especially VEEG monitoring, is essential to distinguish PNES from true epilepsy accurately. This is consistent with other studies advocating for a multimodal diagnostic approach to avoid misdiagnosis and unnecessary antiepileptic treatments (5,12).

Clinical Implications and Recommendations

The study's findings have significant implications for clinical practice. Misdiagnosing PNES as epilepsy can lead to unnecessary antiepileptic drug use, increased healthcare costs, and adverse effects for patients. Conversely, missing a diagnosis of epilepsy due to atypical presentations can result in untreated seizures and increased morbidity. This underscores the importance of utilizing a thorough evaluation strategy that includes neuroimaging, EEG, and VEEG monitoring, particularly in cases where clinical features overlap (13,14).

For PNES patients, integrating psychiatric evaluation and psychological therapy into the management plan is crucial, given the underlying psychological factors often associated with PNES. In contrast, true epilepsy patients benefit from targeted antiepileptic drugs based on the type of seizure and EEG findings, highlighting the need for precise diagnosis (15,16).

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Limitations and Future Directions

This study has several limitations. The sample size was relatively small, which may limit the generalizability of the findings. Future research should involve larger, multicenter cohorts to validate these results across diverse populations. Additionally, incorporating advanced neuroimaging techniques, such as functional MRI (fMRI) and single-photon emission computed tomography (SPECT), could enhance the diagnostic accuracy in distinguishing PNES from true epilepsy. Longitudinal studies to assess the long-term outcomes of patients diagnosed with PNES versus true epilepsy are also warranted.

Conclusion

This study provides a comprehensive analysis of the clinical characteristics and diagnostic challenges in distinguishing Psychogenic Nonepileptic Seizures (PNES) from true epilepsy. The findings highlight the importance of a thorough evaluation combining clinical, neuroimaging, and electrophysiological data to prevent misdiagnosis and ensure appropriate treatment. Tailored management strategies for PNES and true epilepsy are essential to optimize patient outcomes and improve quality of life.

Conflict of Interest

The authors declare that there is no conflict of interest regarding the publication of this paper.

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Ethical Approval

This study was conducted in accordance with the ethical principles of the Declaration of Helsinki. Ethical approval for the study was obtained from the Institutional Ethics Committee of Batra Hospital & Medical Research Centre, New Delhi (Approval Number: [Approval Number]). All participants provided written informed consent prior to their inclusion in the study.

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