Original Article

Clinical profile of psychogenic non-epileptic seizures in adults: A study of 63 cases

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Abstract

Aims: To evaluate clinical profile and short-term outcome of psychogenic non-epileptic seizures (PNES) in Indian adult population. **Setting and Design:** A prospective observational study, conducted at tertiary teaching institute at New Delhi. **Materials and Methods:** Sixty-three patients with confirmed PNES were enrolled. The diagnosis was based on witnessing the event during video-electroencephalography (Video-EEG) monitoring. A detailed clinical evaluation was done including evaluation for coexistent anxiety or depressive disorders. Patients were divided into two groups on the basis of excessive or paucity of movements during PNES attacks. Patients were followed-up to 12 months for their PNES frequency. **Statistical Analysis:** Means and standard deviations were calculated for continuous variables. Chi-square and Students *t*-test were used to compare categorical and continuous variables respectively. **Results:** The mean age at onset of PNES was 25.44 years; with F:M ratio of 9.5:1. Coexistent epilepsy was present in 13 (20.63%) cases. Twenty-two patients (44%) with only PNES ($n = 50$) had received antiepileptic drugs. Out of 63 patients of PNES 24 (38.1%) had predominant motor phenomenon, whereas 39 (61.9%) had limp attacks. The common features observed were pre-ictal headache, ictal eye closure, jaw clenching, resistant behavior, ictal weeping, ictal vocalization, and unresponsiveness during episodes. Comorbid anxiety and depressive disorders was seen in 62.3% and 90.16% patients, respectively. Short-term (6-12 months) outcome of 45 patients was good (seizure freedom in 46.66% and >50% improvement in 24.44% cases). **Conclusion:** PNES is common, but frequently misdiagnosed and treated as epileptic seizures. A high index of suspicion is required for an early diagnosis. Proper disclosure of diagnosis and management of the psychiatric comorbidities can improve their outcome. **Limitation:** Limited sample size and change in seizures frequency as the only parameter for the assessment of the outcome are the two major limitations of our study.

Key Words

Psychogenic non-epileptic seizures, Coexistent epilepsy, video-electroencephalography

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Introduction

Non-epileptic seizures (NES) are episodes of altered movement, sensation, or experience resembling epileptic seizures, without ictal electrical discharges in the brain.[1] The physiological causes of NES include convulsive syncope, paroxysmal vertigo, sleep disorders, panic attacks, movement disorders, transient ischemic attacks, complicated migraine, metabolic disorders, and drug intoxication or withdrawal.[2,3] Psychogenic non-epileptic seizures (PNES) are the commonest non-epileptic events; represents 20-30% of patients being referred for epilepsy surgery evaluation.[4] The incidence of PNES is estimated to be 1.5-3/lakh/year[5,6] and the prevalence ranges from 2-33 cases/lakh persons in the general population.[7,8] PNES occur more frequently in women (75-85%); with onset in young adulthood.[1,9] The prevalence data of coexistent epilepsy and PNES is variably estimated between 5% and 40%.[10-12]

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PNES are categorized as Dissociative (International Classification of Diseases; ICD-10) or Conversion disorder (Diagnostic and Statistical Manual of Mental Disorders; DSM-IV). The major psychiatric comorbidities are somatoform, depressive, anxiety, post-traumatic stress, and personality disorders.[13,14] There are various pre-disposing (sexual or physical abuse, childhood trauma, head injury, intellectual disability, dysfunctional family, borderline-like personality, other psychopathology, defective illness perceptions and coping styles etc.), precipitating (emotional or physical stress, onset of new illnesses, life events, relationship conflicts etc.) and perpetuating factors (frequent health-care contacts, social or financial gain) have been associated with PNES.[15-19]

PNES can imitate any type of seizure event and sometimes may be confused with frontal lobe seizures.[20-23] Owing to clinical variability there is no well-established diagnostic criteria and clinical classification. The historical facts, ability to be induced by suggestion, psychological tests, serum prolactin, and ambulatory EEG are insufficient for the diagnosis of PNES.[24-27] The demonstration of clinical event without concomitant EEG changes during video-EEG is the diagnostic gold standard.[23,28]

PNES requires a very different approach for management and misdiagnosis places the patient at risk of increased morbidity and mortality. The indirect effect through loss of quality of life is much more than direct costs of drugs and investigations. Early diagnosis, proper disclosure of diagnosis, and comprehensive management by psychotherapy and pharmacotherapy can improve the outcome. The outcome of PNES in a given patient is variable, with good short-term outcome.[29-34] However, on long-term follow-up, most patients had recurrences of events.[35-39] The mean latency between manifestation and the diagnosis is about 7-16 years; indicating lack of awareness among patients, their family members as well as among treating doctor.[11,40,41]

Among adults there are very few studies from India.[42-44] Aim of our study was to diagnose PNES, study their clinical and video-EEG profile, and psychiatric comorbidity in adult population.

Materials and Methods

A total of 82 patients, age >14 years with clinical suspicion of PNES with or without any coexisting epilepsy attending neurology outpatient in a tertiary care hospital in North India were enrolled over a period of 2 years (August 2009-July 2011). Clinical suspicion was based on the following criteria:

- Refractory epilepsy or change in symptomatology
- Episodes of variably prolonged unresponsiveness and lying motionless
- Multiple or non-stereotypical seizure patterns
- Occurrence in situations as in front of audience, doctor or in waiting room
- Seizure provoked by emotional stress
- Associated psychiatric disorders.

After a thorough clinical history and detailed neurological examination, all the cases were subjected to video-EEG monitoring. Of 82 patients, 63 (76.82%) had confirmed diagnosis of PNES. The diagnosis of PNES was based on witnessing the event, that occurred either spontaneously or on induction by hyperventilation and verbal suggestion during video-EEG. Based on the clinical semiology, the patients were divided into two groups; type A characterized by excessive motor phenomenon or type B with limp attacks with/out minimal motor phenomenon. All patients were further evaluated for any coexisting anxiety or depressive disorders using DSM-IV criteria and their severities were assessed using Hamilton Depression/Anxiety rating scales. After confirming the diagnosis of PNES, all the patients and the family members were properly explained about the diagnosis; that these episodic events were not due to epilepsy and such phenomenon may occur due to various kinds of stress, lack of coping skills or existent psychological disturbances. All the patients were thoroughly interrogated to identify the possible precipitating factors if any; counseled to increase their self-confidence and coping skills and encouraged to remain socially and occupationally active. Along with counseling, patients were started on antidepressants with/without anxiolytics; according to the psychiatric comorbidity. Antiepileptic drugs were slowly withdrawn in patients with only PNES. All patients were followed-up at 6 and 12 months either by hospital visits or telephonically regarding frequency of PNES. A good outcome was defined as achieving seizure freedom state or >50% improvement.

Statistical methods

Data were entered into Microsoft Excel spreadsheet and statistically analyzed. Means and standard deviations were calculated for all continuous variables. Chi-square test was used to compare categorical variables, and Students *t*-test for continuous variables. $P < 0.05$ was considered the level of statistical significance.

Results

A total of 63 patients were included in the study. Majority of patients were women (90.46%), with the mean age at onset being 25.44 ± 10.22 years. Most of our patients were literate (84.12%), resident of urban areas (55.55%), from nuclear families (58.73%), and were belonging to either upper lower or lower middle class (93.65%) (Modified Kuppuswamy scale 2007). Of the 57 female patients; 33 were house wives, 10 students, and the rest 14 were widows and unmarried females. Of the six male patients, four were gainfully employed, one was unemployed, and one was a student [Table 1].

The main reason for evaluation was the confirmation of primarily suspected PNES in 50/63 (79.36%) patients; of which 22/50 (44%) were initially diagnosed and treated as epilepsy. In the remaining 13/63 (20.63%) patients with coexisting epilepsy; the reasons were; recurrence of seizures in previously controlled epilepsy in seven patients and uncontrolled epilepsy in six patients. Neuroimaging and EEG data of patients with epilepsy coexisting PNES were not been analyzed. Among the patients with only PNES ($n = 50$), we were able to perform inter-ictal EEG in 44 patients, and neuroimaging computed tomography/magnetic resonance imaging (CT/MRI) in 27 patients. Of them, we found 11.36% patients with non-specific EEG abnormalities and none with epileptiform discharges. Single or multiple calcifications were observed in 18.52% patients with only PNES who underwent neuroimaging.

Three patients (4.76%) had spontaneous PNES events, whereas in rest 60 patients the diagnosis was confirmed by inducing the clinical event during video-EEG monitoring. The most common PNES type was limp attacks seen in 39 patients (61.9%); followed by motor attacks in 24 patients (38.1%). The common semiological characteristics observed (in either type) are listed below [Table 2]. Historically, six patients had significant injuries (forehead or occipital bruises) whereas four patients had urinary incontinence and bite on tip of the tongue during the episodes, but not observed during the witnessed episodes.

The comorbid anxiety and depressive disorders were seen in 62.3% and 90.16% cases, respectively. On the assessment of

severity, majority of these patients had moderate-severe scores on Hamilton depression scales (65.56%), and mild-moderate scores on Hamilton anxiety scales (81.76%) respectively [Table 3]. Neurological comorbidities were seen in 38 (60.31%) patients (six had coexistent epilepsy), commonest being chronic tension type headache in 27 patients, migraine in 2, mild mental retardation in 2, alcohol dependence in 2, tubercular meningitis in 1, drug addiction in 1, operated brain tumor in 1, history of significant head injury in 1, and Neuromyelitis Optica in 1 patient respectively.

Table 1: Clinical characteristics of psychogenic non-epileptic seizures patients

Clinical characteristics (*n*=63) (%)	
Females	57/63 (90.46)
Age of onset (years)	25.44±10.22
Age at diagnosis (years)	27.72±11.02
Disease duration (months)	22.64±37.22
PNES frequency (per month)	21.23±32.6
Emotional stress	47/63 (74.6)
Physical abuse	11/63 (17.46)
Sexual abuse	5/63 (7.93)
Stereotyped events	60/63 (95.23)
Utilized emergency services	33/63 (52.38)
Coexistent epilepsy (*n*=13)(%)	
Partial	11/13 (84.61)
Generalized	2/13 (15.38)
Only PNES patients (*n*=50) (%)	
On AEDs	22/50 (44)
Duration of AEDs use (months)	18.66±37.38
Abnormal EEG	
Non-specific	5/44 (11.36)
Epileptiform	Nil
Abnormal imaging	
Single/multiple calcifications	5/27 (18.52)
PNES type (*n*=63)(%)	
Motor attacks	24/63 (38.1)
Limp attacks	39/63 (61.9)

PNES=Psychogenic non-epileptic seizures, EEG=Electroencephalography

Table 2: Semiological characteristics

Features	Motor attack (*n*=24) %	Limp attack (*n*=39) %
Pre-ictal headache	75	94.87
Ictal eye closure	54.16	87.18
Resistant behavior	54.16	74.35
Jaw clenching	50	66.66
Vocalization	37.5	20.51
Unresponsiveness	20.83	28.2
Ictal weeping	29.16	28.2

Table 3: Comorbidities

Psychiatric Comorbidities (*n*=61) (%)	
Depressive disorders	55/61 (90.16)
Hamilton depression rating scale HAM-D score	17.13±3.36
Anxiety disorders	38/61 (62.3)
Hamilton anxiety rating scale HAM-A score	15.88±3.75
Somatoform disorder	17/61 (27.86)
Dissociative disorder	2/61 (3.28)
Neurological comorbidities (*n*=63) (%)	
Chronic tension type headache	27/63 (42.85)
Others	11/63 (17.46)

We were able to follow-up 32 patients (50.8%) for 12 months, 13 patients (20.63%) for 6 months and 9 patients (14.28%) for 3 months. Nine patients (14.28%) were lost to follow-up. A total of 45 patients with follow-up of 6-12 months were included in analysis. Of these, 31 patients (68.88%) had good outcome (46.66% seizure free and 24.44% had >50% improvement). Among the 14 patients, (31.11%) with poor outcome; six patients (13.33%) had <50% improvement, another four (8.88%) had persistent PNES with same frequency whereas the remaining four (8.88%) patients had increase in PNES frequency from baseline. In our study, good outcome predictors were younger age ($P = 0.54$), short duration of illness ($P = 0.44$), less frequent episodes ($P = 0.66$), patients with limp attacks ($P = 0.27$). However, effect of gender, coexistent epilepsy, and psychiatric comorbidity could not be assessed because of incomparable data.

Discussion

Similar to the previous studies majority of our patients were women (90.46%) in late 2nd-3rd decade (72%) of their life; with a mean age of onset and presentation of PNES 25.44 years and 27.72 years respectively. In one previous Indian study of 71 adult patients with PNES (Lazarus 2003), compared to our study there was a younger population group (mean age at onset 19.68 years) and a lower proportion of women (78.9%).[42] The likely reason is the fact that majority of patients in their study were students whereas married females constituted majority of our patients.

Most of our patients came from nuclear families with poor emotional and peer support. Emotional stress was the precipitating factor in 74.6% of our patients, but only 17.46% of our patients had reported physical abuse. The lower reporting of sexual abuse (7.93%) by our patients as compared to previous studies (11-67%) was likely due to our social structure, fear of earning disrepute and legal issues.[14,19,32,45,46] The data about comorbid psychiatric illnesses is highly variable because of the use of different nomenculture, criteria, and classifications.

The majority (79.36%) of our patients were having only PNES. Whereas 20.63% of our patients had coexistent PNES and epileptic seizures, of them the commonest being partial seizures (84.61%). The available data of coexistence of PNES and epilepsy is highly variable (5-40%); because of the differences in study population, study type, and reasons for video-EEG monitoring.[10-12] Forty-four percent of our patients with only PNES ($n = 50$) were misdiagnosed and treated as epileptic seizures; which is not an uncommon observation (31-75.5%) in older studies.[32,42,47-49] Utilization of emergency services for management of PNES is common; seen in 52.38% of our patients, similar to observations by McKenzie (49.7%).[32] Historically, 20.63% of our patients had presentation as pseudostatus; similar to that reported by Reuber (20.1%).[36]

In our study, the mean delay in diagnosis of PNES was nearly 2 years (22.64 months); whereas most studies have reported a mean delay of 1.5-9 years.[14,31,32,41-43] The possible reasons for the delay in diagnosis was lack of awareness both among patients and treating doctor, use of alternative system of medicine, and belief that these events were due to supernatural causes. Shorter duration of video-EEG monitoring and early use of induction protocol, are the reasons for lower rates of spontaneous PNES events (4.76%) in our patients. As expected, more spontaneous events were seen with prolonged monitoring; as reported in 71-96.2% cases within 48 h of video-EEG monitoring in previous studies.[48,50,51]

In contrast to older belief that a PNES patient had multiple or changing semiology; recent studies have shown that majority of PNES attacks are similar in a patient.[42,52] Historically, 95.23% of our patients were having stereotyped events that were confirmed by eye witness of previous event and event during V-EEG monitoring. There is no uniform clinical semiological classification of PNES; and in most of the studies patients were classified on the basis of either excessive or paucity of motor phenomenon. In most of the studies, the commonest PNES subtypes were attacks with excessive motor phenomenon (52-77%).[48,51-55] In contrast, limp attacks were the most common PNES type (61.9%) seen in our patients; similar to other Indian studies (Lazarus 2003: 59.2%; Dhanraj 2005: 53.3%).[42-44] The reason behind this is not clear; but probably it is the cultural difference and poor emotional support in our patients, especially among the females.

Apart from classical ictal features of a typical motor or limp attack; a significant number of our patients had pre-ictal headache (87.3%), ictal eye closure (74.6%), resistant behavior (66.66%), jaw clenching (60.31%), ictal weeping (28.57%), ictal vocalization (26.98%), and unresponsiveness (25.4%) during episodes. A few studies had reported significant injuries, urinary incontinence and tongue bite with PNES episodes.[40,53,56] Historically, six of our patients had significant injuries over forehead or occipital areas; whereas four each had urinary incontinence and bite over tip of the tongue.

Abnormal non-epileptiform inter-ictal EEG (46-54%),[41,52,53,57] and abnormal neuroimaging (30-43%)[30,53] are not uncommon in PNES patients without coexisting epilepsy. None of our patients with only PNES had epileptiform discharges; although 11.36% had non-specific inter-ictal EEG abnormality. Similarly, 18.52% our patients with only PNES had single or multiple calcified lesions on CT brain. It should be kept in mind that neurocysticercosis is endemic in India, and asymptomatic calcified lesions in brain are not uncommon in our population. Our main focus was to identify comorbid depressive and anxiety disorders. We found a high incidence of depressive (90.16%) and anxiety disorders (62.3%) in our patients. Most of them had moderate-severe depression and mild-moderate anxiety scores respectively. Chronic tension type headache (42.85%) was the commonest neurological comorbidity.

At short term follow-up (<1 year), about 19-67% patients were seizure free and additional 21-56% had significant reduction in seizure frequency.[29-34] However, many patients with good initial outcome had recurrence of events on long term follow-up. The long term (1-14 years) follow-up studies variably reported seizure freedom rates from 16-40%.[11,35-39] In the recently published largest series (260 patients) of short term (6-12 months) outcome of PNES patients by McKenzie (2010); 38% of patients had been free of spells and additional 23% patients had at least 50% reduction in spell frequency.[32] To the best of our knowledge, there are no studies addressing prognosis of PNES and their factors in adult population from India. Similar to older studies, the short term (6-12 month) outcome was good in our study; which included cessation of seizures in 46.66% and >50% reduction in seizure frequency in 24.44% patients. The most important prognostic factor probably is the acceptance of the diagnosis of PNES by patients and their family members. The other favorable prognostic factors reported are young age at onset,[36,47] male[32] or female,[37] better education,[47,55] good social, family, and security support system,[31,32,34,37] employment, and independent lifestyle,[34,35,37] low intelligence quotient[32,58] shorter duration of condition,[39,47] less frequent episodes,[43] accepting the diagnosis,[31,34] motionless spells,[39,47,55] lack of comorbid epilepsy,[37,47,59] continued antiepileptic drugs (AEDs) use,[35] lack of physical or sexual abuse,[30] and lack of psychiatric comorbidities.[30,32,47] The possible good prognostic factors in our study were young age at onset ($P = 0.54$), shorter duration of illness ($P = 0.44$), less frequent episodes ($P = 0.66$), and limp attacks ($P = 0.27$).; although none was statistically significant. The effect of gender, literacy status, socioeconomic status, coexisting epilepsy and comorbid psychiatric illnesses on the outcome could not be analyzed because of inadequate sample size.

Apart from small sample size and incomparable data, the other potential limitation of our study was that the outcome assessment was based only upon reduction in frequency of seizures, and other parameters as use of AEDs, employment, quality of life, etc., were not studied. So, larger studies with longer follow-up and addressing these issues are required to find out the outcome factors in Indian population.

Conclusion

PNES is common among young women. PNES is frequently misdiagnosed and wrongly treated as epileptic seizures. A high index of suspicion is required for an early diagnosis. Proper disclosure of diagnosis and management of the psychiatric comorbidities can improve the outcome and overall quality of life of patients with PNES.

Limitation

There are two major limitation of our study, first is limited sample size. Secondly, follow-up is only in terms of change in seizures frequency; while other parameters as use of AEDs, socio-occupational functioning, psychiatric comorbidity outcome, and quality of life was not assessed.

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