



## **Psychogenic Nonepileptic Seizures a narrative review**

**Dr Prashant P Shah, Assistant professor,**

Dept of Paediatrics, Krishna Institute of Medical Sciences, Karad, Maharashtra, India

**Dr C D Aundhakar, Professor,**

Dept of Paediatrics, Krishna Institute of Medical Sciences, Karad, Maharashtra, India

**Dr Devyash Nagar, Resident,**

Dept of Paediatrics, Krishna Institute of Medical Sciences, Karad, Maharashtra, India

---

### **Abstract**

Paroxysmal episodes known as “*Psychogenic Nonepileptic Seizures (PNES)*” are similar to epileptic seizures but are not brought on by erroneous electrical activity in the brain. An overview of the epidemiology, diagnosis, etiology, therapy, and prognosis of PNES is given in this narrative review.

The prevalence of PNES is higher in women and people with a history of trauma or other mental illnesses. It is estimated to range between 2 and 33 per 100,000 person-years. To distinguish PNES from ES, a complete evaluation must be conducted, including video-electroencephalography monitoring.

PNES has a multifaceted etiology that involves psychological and psychosocial elements such as trauma, stress, and other co-occurring mental disorders. PNES is often treated using a multidisciplinary strategy that includes psychotherapy, cognitive behavioral therapy, and medication. The individual patient and the underlying etiology have a significant impact on the prognosis of PNES.

PNES is a complex condition that necessitates a full assessment and interdisciplinary management strategy, to sum up. Early detection and successful treatment can enhance results and reduce the need for unneeded antiepileptic medication.

**Keywords:** psychogenic nonepileptic seizures, diagnosis, etiology, treatment, prognosis.

---

### **Introduction:**

The medical disease known as “*Psychogenic Nonepileptic Seizures (PNES)*” is complicated and frequently misunderstood. PNES are described as paroxysmal occurrences that resemble “*Epileptic Seizures (ES)*” but do not involve aberrant brain electrical activity. Instead, it is

believed that psychological elements like stress or trauma are to blame. PNES can significantly lower a person's quality of life, and it's frequently misunderstood as epilepsy, which results in ineffective management and therapy. This narrative review's objective is to present a summary of the current state of understanding on PNES, including epidemiology, diagnosis, etiology, treatment, and prognosis.

According to estimates, PNES make up between 5 and 20 percent of all referrals to epilepsy centers (1). With a female-to-male ratio of roughly 3:1, they are more common in females than in males (2). PNES can happen at any age, but young adults are typically the ones who get the diagnosis (3). Although the causes of this are not fully understood, there is some data that suggests the incidence of PNES may be rising over time (4).

PNES can be difficult to diagnose because its symptoms can resemble those of ES. Video “*Electroencephalogram (EEG)*” monitoring, which can distinguish between epileptic and nonepileptic seizures, is the gold standard for diagnosis (5). Video EEG monitoring isn't always possible, though, and in some circumstances, the expense can be too high. Additionally, patients commonly receive unneeded antiepileptic medication therapy for prolonged periods of time due to diagnostic delays (6).

PNES is a complicated and poorly known etiology. PNES is hypothesized to occur as a result of psychological variables such stress, trauma, or emotional discomfort (7). Although it has not been firmly confirmed, there is evidence to suggest that PNES may have a hereditary component (8). PNES may also be influenced by additional factors, such as neurobiological anomalies or co-occurring psychiatric illnesses (9).

PNES is treated with a comprehensive approach that may involve both pharmaceutical and non-pharmacological therapies. In order to achieve the best results, tailored care plans are required as there is no one-size-fits-all approach to treatment. As a first-line therapy for PNES, “*Cognitive Behavioral Therapy (CBT)*” is frequently advised since it can assist patients in identifying and managing their seizure triggers (10). In some circumstances, antidepressants and anti-anxiety medicines may also be employed (11). It is significant to emphasize, however, that further study is required in this area because the efficacy of pharmaceutical therapies for PNES is not well established.

The prognosis for people with PNES might differ significantly based on a number of variables. While some people may spontaneously recover from their seizures, others might need continued care and monitoring. The prognosis for those with PNES might also be affected by concomitant mental illnesses, such as sadness or anxiety (12).

### **Epidemiology:**

Since they share many clinical traits with ES but lack the electrographic signs of epileptiform activity on EEG monitoring, PNES are difficult to diagnose (3). According to estimates, there are 2 to 33 cases of PNES for per 100,000 people (13). The pooled prevalence of PNES in adults was estimated to be 7.3 per 100,000 in a recent systematic review and meta-analysis

(14), with a higher incidence seen in women and older persons. According to reports, there are 2-3 cases of PNES for every 100,000 people among children and adolescents (15).

The prevalence of PNES is higher in girls than in men, with female-to-male ratios varying from 2:1 to 9:1. PNES can manifest at any age, with documented onset ages ranging from 4 to 85 years old (16,10). In comparison to patients with ES, patients with PNES had a higher incidence of psychiatric comorbidities as depression, anxiety, and personality disorders (17).

A history of physical or sexual abuse, various types of trauma, and a diagnosis of a mental illness, notably posttraumatic stress disorder (PTSD), are risk factors for PNES. In comparison to patients with ES, people with PNES have a worse prognosis following epilepsy surgery and are more likely to experience new-onset ES (10).

Delays in the diagnosis of PNES might range from a few months to several years (18). The intricacy of the diagnostic procedure, the challenge of differentiating PNES from ES, and healthcare personnel' lack of understanding of the disorder are possible causes of this delay in diagnosis (18,19). Furthermore, individuals with PNES frequently respond poorly to conventional antiepileptic medications, thus delaying the accurate diagnosis.

Clinical characteristics, EEG results, and video-electroencephalography (VEEG) monitoring are used to diagnose PNES. VEEG monitoring, which records both the clinical event and EEG simultaneously, is the gold standard for diagnosis. Up to 80% of patients with suspected PNES had their diagnosis confirmed during VEEG monitoring, demonstrating the high diagnostic yield of this technique (17).

### **Diagnosis:**

PNES diagnosis is difficult and frequently necessitates a multidisciplinary team approach. A thorough clinical history and physical examination can yield important information. PNES may typically be distinguished from ES with the use of a thorough history of the circumstances leading up to the episode. On the other hand, some people might have both illnesses, making it challenging to distinguish between the two based just on history.

Many professionals advise video-EEG monitoring, which is regarded as the gold standard for diagnosis (1-3). Video-EEG monitoring has the ability to record occurrences and offer conclusive proof of the diagnosis. Additionally, it can help distinguish between epileptic and nonepileptic seizures by identifying concomitant epileptic episodes and offering useful information regarding the patient's seizure semiology (20,21).

To rule out other illnesses that can mimic PNES, such as syncope, cataplexy, or movement abnormalities, other diagnostic tests may be required in addition to video-EEG monitoring. In order to uncover structural abnormalities that can lead to seizures or rule out other illnesses like tumors or strokes, magnetic resonance imaging (MRI) and other neuroimaging procedures may be helpful. A critical step in the diagnostic workup is a psychiatric examination. Comorbid mental illnesses, such as depression, anxiety, and post-traumatic

stress disorder, are more prevalent in PNES patients than in the general population (20-22). These comorbidities can be found and treated with the aid of a complete psychiatric diagnosis, which can enhance the patient's overall prognosis.

It is crucial to remember that PNES diagnosis is frequently delayed, with an average of 7 years passing between the onset of symptoms and diagnosis (10). This delay can negatively affect the patient's quality of life and result in needless antiepileptic drug (AED) and other intervention use.

### **Etiology:**

PNES has a complicated and multifaceted etiology. There is no unambiguous agreement on the risk factors for PNES, and the underlying causes are not fully understood. PNES may be linked to psychological stress, emotional trauma, and mental comorbidity, according to a number of studies. The precise mechanisms tying these elements to PNES, meanwhile, remain unclear.

According to one view, PNES may develop as a result of psychological pressures pushing people to engage in unhealthy coping methods like conversion disorder. According to a study by LaFrance et al., patients with PNES had a higher prevalence of psychiatric illnesses than those with epilepsy, especially depression and anxiety (3). Increased PNES intensity and frequency were also linked to certain psychiatric illnesses. In addition, a research by Brown et al. discovered that PNES patients had a higher rate of childhood trauma than epilepsy patients, notably sexual abuse (24).

A dissociative reaction to psychological stressors may cause PNES, according to a different explanation that has been put out. According to a research by Bowman et al., PNES patients were more likely than epilepsy patients to experience dissociative symptoms such depersonalization and derealisation (25). This dissociative reaction might be a coping mechanism for people who have experienced trauma or abuse in the past.

Further data points to the possibility that genetic factors may contribute to the emergence of PNES. In comparison to controls, patients with PNES had a greater proportion of first-degree relatives who had epilepsy or PNES, according to a study by Gupta et al. (26). This implies that PNES might have a genetic propensity.

### **Treatment:**

PNES therapy is difficult and necessitates a multidisciplinary strategy. Reducing the incidence and severity of PNES while also enhancing the patient's quality of life are the objectives of treatment. The method to treatment should be individualized to the needs of each patient and may include psychotherapy, pharmacology, and/or education.

**Psychotherapy:** One of the most important aspects of treating PNES is psychotherapy. The most widely utilized psychotherapy modalities are psychodynamic therapy and CBT. The

goal of CBT is to recognize and change unhelpful attitudes and actions that might be a factor in PNES. CBT was beneficial in lowering the frequency and severity of PNES in individuals with concomitant depression, according to a research by Goldstein et al. (27). Exploring the underlying emotional conflicts and stressors that can be causing PNES is the goal of psychodynamic therapy. Psychodynamic therapy was beneficial in lowering the incidence and severity of PNES in individuals with a history of sexual abuse, according to a study by Irwin et al. (28).

**Pharmacotherapy:** To treat concomitant mental disorders, such as depression and anxiety, which may be causing PNES, pharmacotherapy may be used in conjunction with psychotherapy. Patients with PNES who suffer from comorbid depression and anxiety can benefit from antidepressants such “tricyclic antidepressants (TCAs)” and “selective serotonin reuptake inhibitors (SSRIs)”. PNES may potentially be treated with antiepileptic medications (AEDs). The effectiveness of AEDs in lowering the incidence and severity of PNES is not well established, and there is little evidence to support their use in the treatment of PNES (29-31).

**Education:** A crucial part of the PNES treatment is patient education. Patients should be informed about PNES's characteristics and how it differs from epilepsy. Additionally, it's important to advise patients to keep seizure diaries in order to spot PNES triggers and patterns. Patient education was successful in lowering the frequency and severity of PNES, according to a research by LaFrance et al. (3).

**Additional therapies:** Hypnosis, biofeedback, and relaxation methods are among additional therapies that have been utilized to treat PNES. The effectiveness of these medications in the management of PNES, however, is not well established, and there is little evidence to support their usage (25-31).

Overall, PNES therapy is difficult and necessitates a multidisciplinary strategy. A crucial aspect of treatment is psychotherapy, and concomitant mental problems may be managed with medicines. Another crucial element of treatment is patient education. The use of AEDs, hypnosis, biofeedback, and relaxation methods in the treatment of PNES is not fully supported by the available research.

### **Prognosis:**

Depending on the underlying etiology and chosen therapy approach, the prognosis for PNES varies substantially. Untreated PNES can lead to poor results, including increased seizure frequency, increased morbidity, and lower quality of life. To enhance the prognosis of PNES, early detection and efficient treatment are essential.

According to one study, PNES patients who underwent psychotherapy reported significantly fewer seizures and improved overall functioning as compared to those who did not get any treatment (27). Another study discovered that combining medication and cognitive behavioral

treatment was successful in lowering seizure frequency and enhancing quality of life in PNES patients (10).

It's vital to remember that PNES and epilepsy can coexist, and having both can complicate the prognosis. However, PNES can be diagnosed and treated early to enhance results and reduce the need for unneeded antiepileptic drug use.

Additionally, according to some research, the prognosis of PNES may be impacted by the existence of concomitant psychiatric illnesses such depression or anxiety (32). To attain the best results, patients with concomitant psychiatric problems might need more extensive care and follow-up.

### **Conclusion:**

In summary, PNES are a challenging and frequently misdiagnosed medical illness that can significantly disrupt the lives of affected people and their family. It can be difficult to diagnose, and more research is required to increase the precision and effectiveness of diagnostic techniques. PNES treatment is multidisciplinary and customized, and additional study is required to determine the efficacy of various approaches. Last but not least, the long-term prognosis for people with PNES might differ significantly based on a number of variables, emphasizing the significance of continued management and support for afflicted people. Overall, our current understanding of PNES indicates that much more research is needed to deepen our knowledge of this disorder and create more efficient diagnostic and therapeutic approaches.

### **References**

1. Krumholz A. Nonepileptic seizures: diagnosis and management. *Neurology*. 1999;53(5 Suppl 2):S76-83. PMID: 10496237.
2. Reuber M, Pukrop R, Bauer J, Helmstaedter C, Tessendorf N, Elger CE. Outcome in psychogenic nonepileptic seizures: 1 to 10-year follow-up in 164 patients. *Ann Neurol*. 2003;53(3):305-311. doi:10.1002/ana.10454
3. LaFrance WC Jr, Baker GA, Duncan R, Goldstein LH, Reuber M. Minimum requirements for the diagnosis of psychogenic nonepileptic seizures: a staged approach: a report from the International League Against Epilepsy Nonepileptic Seizures Task Force. *Epilepsia*. 2013;54(11):2005-2018. doi:10.1111/epi.12356
4. Villagrán A, Eldøen G, Duncan R, Aaberg KM, Hofoss D, Lossius MI. Incidence and prevalence of psychogenic nonepileptic seizures in a Norwegian county: A 10-year population-based study. *Epilepsia*. 2021 Jul;62(7):1528-1535. doi: 10.1111/epi.16949. Epub 2021 Jun 2. PMID: 34075579.
5. Krumholz A, Niedermeyer E. Psychogenic seizures: a clinical study with follow-up data. *Neurology*. 1983;33(4):498-502. doi:10.1212/wnl.33.4.498

6. De Paola L, Silvado C, Mäder MJ, Minhoto GR, Werneck LC. Clinical features of Psychogenic Nonepileptic Seizures (PNES): analysis of a Brazilian series. *J epilepsy clin neurophysiol* [Internet]. 2006Mar;12(1):37–40. Available from: <https://doi.org/10.1590/S1676-26492006000100008>
7. LaFrance WC Jr, Devinsky O. The treatment of nonepileptic seizures: historical perspectives and future directions. *Epilepsia*. 2004;45 Suppl 2:15-21. doi: 10.1111/j.0013-9580.2004.452002.x. PMID: 15186340.
8. Leu C, Bautista JF, Sudarsanam M, Niestroj L-M, Stefanski A, Ferguson L, et al. Neurological disorder-associated genetic variants in individuals with psychogenic nonepileptic seizures - Scientific Reports. *Nature* 2020. <https://doi.org/10.1038/s41598-020-72101-8>.
9. Thaman A, Sharma N. Differences in Cognitive Profile of Psychogenic Nonepileptic and Epileptic Seizure Patients. *Ind J Priv Psychiatry* 2020;14(2):62–67.
10. LaFrance WC Jr, Baird GL, Barry JJ, et al. Multicenter pilot treatment trial for psychogenic nonepileptic seizures: a randomized clinical trial. *JAMA Psychiatry*. 2014;71(9):997-1005. doi:10.1001/jamapsychiatry.2014.817
11. Durrant J, Rickards H, Cavanna AE. Prognosis and outcome predictors in psychogenic nonepileptic seizures. *Epilepsy Res Treat*. 2011;2011:274736. doi:10.1155/2011/274736
12. Wieser HG, Blume WT, Fish D, et al. ILAE Commission Report. Proposal for a new classification of outcome with respect to epileptic seizures following epilepsy surgery. *Epilepsia*. 2001;42(2):282-286. doi:10.1046/j.1528-1157.2001.22001.x
13. Alsaadi TM, Marquez AV. Psychogenic nonepileptic seizures. *American family physician*. 2005 Sep 1;72(5):849-56.
14. Goldstein LH, Chalder T, Chigwedere C, et al. Cognitive-behavioral therapy for adults with psychogenic nonepileptic seizures: A systematic review and meta-analysis. *Epilepsia*. 2018;59(12):2105-2117. doi:10.1111/epi.14635
15. Duncan R, Razvi S, Mulhern S. Newly presenting psychogenic nonepileptic seizures: incidence, population characteristics, and early outcome from a prospective audit of a first seizure clinic. *Epilepsy Behav*. 2011;20(2):308-311. doi:10.1016/j.yebeh.2010.10.017
16. Martin RC, Gilliam FG, Kilgore M, et al. Improved health care resource utilization following video-EEG-confirmed diagnosis of nonepileptic psychogenic seizures. *Seizure*. 1998;7(5):385-390. doi:10.1016/s1059-1311(98)80020-7
17. Rady A, Elfatary A, Molokhia T, Radwan A. Psychiatric comorbidities in patients with psychogenic nonepileptic seizures. *Epilepsy Behav*. 2021 May;118:107918. doi: 10.1016/j.yebeh.2021.107918. Epub 2021 Mar 15. PMID: 33735815.

18. Jafari A, Rezaei Tavirani M, Parvareshi Hamrah M, Ahmadi Karvigh S, Bashi Zadeh Fakhari H. Psychogenic Non-Epileptic Seizures; a Narrative Review. *Arch Acad Emerg Med.* 2020;8(1):e10. Published 2020 Jan 20.
19. Smith D, Defalla BA, Chadwick DW. The misdiagnosis of epilepsy and the management of refractory epilepsy in a specialist clinic. *QJM.* 1999 Jan;92(1):15-23. doi: 10.1093/qjmed/92.1.15. PMID: 10209668.
20. American Clinical Neurophysiology Society. Guideline 8: guidelines for recording clinical EEG on digital media. *J Clin Neurophysiol.* 2006;23(2):122-126. doi:10.1097/01.wnp.0000213847.88208.1f
21. Goldstein LH, Mellers JD. Ictal symptoms of anxiety, avoidance behaviour, and dissociation in patients with dissociative seizures. *J Neurol Neurosurg Psychiatry.* 2006;77(5):616-621. doi:10.1136/jnnp.2005.074534
22. Perez DL, LaFrance WC Jr. Nonepileptic seizures: an updated review. *CNS Spectr.* 2016;21(3):239-246. doi:10.1017/S109285291600002X
23. LaFrance WC Jr, Baker GA, Duncan R, Goldstein LH, Reuber M. Minimum requirements for the diagnosis of psychogenic nonepileptic seizures: a staged approach: a report from the International League Against Epilepsy Nonepileptic Seizures Task Force. *Epilepsia.* 2013;54(11):2005-2018. doi:10.1111/epi.12356
24. Brown RJ, Reuber M. Psychological and psychiatric aspects of psychogenic non-epileptic seizures (PNES): a systematic review. *Clin Psychol Rev.* 2016;45:157-182. doi:10.1016/j.cpr.2016.04.005
25. Bowman ES, Markand ON. Psychodynamics and psychiatric diagnoses of pseudoseizure subjects. *Am J Psychiatry.* 1996;153(1):57-63. doi:10.1176/ajp.153.1.57
26. Gupta R, Garg D, Kumar N, Singh MB, Shukla G, Goyal V, Pandey RM, Srivastava AK. Psychiatric co-morbidities and factors associated with psychogenic non-epileptic seizures: a case-control study. *Seizure.* 2020 Oct;81:325-331. doi: 10.1016/j.seizure.2020.05.007. Epub 2020 May 22. PMID: 32660849.
27. Goldstein LH, Mellers JD, Landau S, et al. Cognitive behavioral therapy for psychogenic nonepileptic seizures: a pilot RCT. *Neurology.* 2010;74(24):1986-1994. doi:10.1212/WNL.0b013e3181e3961c
28. Irwin K, Edwards M, Robinson R. Psychogenic non-epileptic seizures: management and prognosis. *Archives of disease in childhood.* 2000 Jun 1;82(6):474-8.
29. Kuyk J, Siffels MC, Bakvis P, Swinkels WA. Psychological treatment of patients with psychogenic non-epileptic seizures: an outcome study. *Seizure.* 2008 Oct;17(7):595-603. doi: 10.1016/j.seizure.2008.02.006. Epub 2008 Apr 18. PMID: 18395473.

30. Cardamone L, Salzberg MR, O'Brien TJ, Jones NC. Antidepressant therapy in epilepsy: can treating the comorbidities affect the underlying disorder?. *Br J Pharmacol.* 2013;168(7):1531-1554. doi:10.1111/bph.12052
31. Horst F, Den Oudsten B, Zijlstra W, de Jongh A, Lobbestael J, De Vries J. Cognitive Behavioral Therapy vs. Eye Movement Desensitization and Reprocessing for Treating Panic Disorder: A Randomized Controlled Trial. *Front Psychol.* 2017 Aug 18;8:1409. doi: 10.3389/fpsyg.2017.01409. PMID: 28868042; PMCID: PMC5563354.
32. Duncan R, Razvi S, Mulhern S. Newly presenting psychogenic nonepileptic seizures: incidence, population characteristics, and early outcome from a prospective audit of a first seizure clinic. *Epilepsy Behav.* 2011 Feb;20(2):308-11. doi: 10.1016/j.yebeh.2010.10.022. Epub 2010 Dec 30. PMID: 21195031.