

Non-epileptic Seizures: Classification Co-existence with Epilepsy: Diagnosis, Therapeutic Approaches and Consensus

by John R. Gates, MD.

President, Minnesota Epilepsy Group, PA[®]

310 North Smith Avenue

Suite 300

St. Paul, MN 55102

and

Clinical Professor, Department of Neurology, University of Minnesota

Minneapolis, MN

Terminology and Classification of Non-epileptic Seizures

Non-epileptic seizures (NES) is a descriptive term for a diverse group of disorders that refer to paroxysmal events that can be mistaken for epilepsy, but are not due to an epileptic disorder. “Non-epileptic seizure” is the preferred term. As confirmed by Steven Schachter, MD¹ in his 1966 survey of American epileptologists, the majority of respondents considers this to be the preferred term as opposed to many other anachronistic and pejorative terms, which have been suggested. These include “hystero-epilepsy, hysterical seizures, pseudoseizures, pseudo-epileptic seizures, non-epileptic pseudo-seizure, hysterical epilepsy, and non-epileptic attack disorder.” All of these terms have significant demeaning overtones, or, quite frankly, are inaccurate in terms of the pathophysiology.

For example, “hystero-epilepsy” implies a hysterical conversion reaction, a very precise psychiatric diagnosis, and, as will be seen from the differential diagnosis presented below, a term that simply does not cover the full spectrum of these disorders. As well, “hysterical” is a somewhat derogatory term in common lay parlance, seemingly describing a female-only disorder. Similarly, “pseudo-seizure” or “pseudo-epileptic seizure” would appear to be adopted from the neutral connotative environment of “pseudocyst.” Though the latter term is not, perhaps, confusing to those of us steeped in medical terminology, this term connotes a significant disparaging overtone when considered in the context of such terms as “pseudo-intellectual,” inferring pretense. Therefore, it would appear appropriate to avoid misleading terminology. Finally, the recently suggested term of “non-epileptic attack disorder” as suggested by Betts and Duffy², also fails to be sensitive to the significant number of patients who are having these events secondary to significant sexual or physical abuse.

As identified in figure 1, there are two sub-categories of non-epileptic seizures: “physiologic” and “psychogenic.” The physiologic group is summarized in figure 2 and includes a broad spectrum of disorders, such as syncope, paroxysms of acute neurological insults, paroxysmal toxic phenomena, non-toxic organic hallucinosis, non-epileptic

myoclonus, sleep disorders, paroxysmal movement disorders, paroxysmal endocrine disturbances and TIAs.

The psychogenic non-epileptic seizure group includes a number of DSM-IV diagnostic categories, including the reinforced behavior pattern, which is not DSM-IV identifiable, and relates to cognitively challenged patients who, paradoxically, have been reinforced for their psychogenic non-epileptic seizures because of a simple, secondary gain in terms of controlling their environment. Figure 3 presents the spectrum of these disorders.

Epidemiology of Non-epileptic Seizures

Unfortunately, the true statistical prevalence of NES is unknown. Nonetheless, we do know from the results of surveys performed in the United States and in Europe that NES patients account for 20% of tertiary care epilepsy unit admissions.³ Scott has estimated the incidence in an outpatient epilepsy clinic at 5%.⁴ But the actual numbers have never been properly captured, with the exception of one study from Iceland⁵ that corroborates Scott's estimates. Importantly, as evidenced by figure 3, the NES population is quite heterogenous, and very importantly, the economic impact of the disorder is likely to be very costly to society. Many of these patients have repeated visits to emergency rooms or they are inappropriately treated with antiepileptic medications. Until definitive EEG monitoring in a multidisciplinary team approach setting transpires, effectively determining the diagnosis and instituting an appropriate course of therapy is, or course, problematic.

In adults, repeated studies demonstrate a fairly consistent 4:1 female:male ratio for psychogenic non-epileptic seizures. In the pediatric population, however, a 2:1 female:male ratio appears to exist--under the age of ten, the ratio is probably more of a 1:1.⁶

The coincidence of non-epileptic seizures and epilepsy is a further confounding variable for definitive diagnosis and treatment. 30% of patients admitted to tertiary care epilepsy units have co-incidence disorders. Though there is a considerable estimated range of between 10-50%, again, no formal epidemiological study has every been performed.⁶

Ictal Characteristics and Diagnosis

Ictal characteristics of non-epileptic seizures have been studied and there are some bedside parameters that can be of use to assist the clinician in determining whether an event is likely to be non-epileptic or epileptic.⁷ As figure 4 demonstrates, for tonic-clonic resembling events, a high degree of confidence can be gained by observing out-of-phase upper extremity and lower extremity movements or vocalization at the start of the event, as opposed to 20-second into the event, when a true tonic-clonic seizure makes the tonic-clonic transformation. Additional parameters of high amplitude forward pelvic thrusting and the lack of rigidity can also be useful for increasing the confidence of the clinical

diagnosis to preclude inappropriate aggressive treatment with antiepileptic medication, assuming a status epilepticus scenario.⁷

As evidenced in figure 5,⁷ ictal duration can also be of utility for assessing tonic-clonic resembling-events; a tonic-clonic seizure generally lasts 70 seconds, plus or minus 20-seconds. Any tonic-clonic resembling-event going beyond this point should raise the suspicion of possible non-epileptic seizures, though obvious care needs to be taken that a true status epilepticus scenario is not transpiring.

Atypical complex partial events are often difficult to determine as to whether they are epileptic or non-epileptic. A blank stare unassociated with any movement, in particular, is a difficult differentiation without concomitant video-EEG monitoring to observe any ictal pattern. Nonetheless, there are suggestive features to differentiate non-epileptic seizures from atypical epileptic seizures. Atypical epileptic seizures tend to be brief, frequent and have a rapid recovery.⁸ Additionally, epileptic tonic-clonic and partial complex seizures most reliably elevate prolactin levels at approximately 20-minutes post-start of the event.⁸ However, care should be taken to observe the patient closely to see that there is no nipple manipulation in females, which can spuriously elevate prolactin levels. Similarly, convulsive syncope can elevate prolactins and have associated automatisms.⁹ Not all partial complex seizures consistently elevate prolactins. Finally, psychotropics, including the new atypical antipsychotics, can elevate prolactins thereby necessitating a baseline determination prior to the interpretation of any elevation.¹⁰

Recording one non-epileptic seizure is not sufficient for a definitive diagnosis. The significant number of patients (30% on average) having mixed epileptic and non-epileptic seizure disorders, reduction of medication and further recording to exclude an underlying epileptic diathesis is important.⁶ In addition, for those unusual events that do not demonstrate surface EEG correlates predominantly consisting of electro-decremental epileptiform fast ictal patterns, repeated recordings of the ictal event to tease out any stereotypicity is critical.⁸ Epileptic seizures have a clear threat of stereotypicity, whereas the non-epileptic events are much more likely to have significant variation between them. Having video-taped examples of the events and having the opportunity to review them in close succession significantly facilitates the ability to make a definitive diagnosis.

Diagnosis of Non-epileptic Seizures

In the attempt to diagnose NES, the induction of non-epileptic seizures can be misleading.¹ This is a very controversial area.¹ This is particularly problematic in patients who have had a previous sexual or physical assault/abuse as the precipitant for their conversion reaction. Making a diagnosis in these individuals by induction, which is inherently a deceptive practice, can, in my experience, significantly impair the subsequent trust in the therapeutic relationship. Therefore, inducing events would not appear to be a prudent course of action.

To arrive at a precise diagnosis, it is vital that a precise description of the patient's events of concern be obtained from the caregiver. Very often video-taped examples are available from a home video to help identify the target events. A careful review of the history must transpire to clearly ascertain if there is or is not a history of epileptic events. A definitive EEG recording should transpire with multiple ictal events characteristic of the event/s of concern recorded to clarify which events are non-epileptic and which, if any, are epileptic. Based on this information and the interictal or ictal video-EEG, a decision can then be made to either discontinue antiepileptic drugs for pure non-epileptic seizures or to continue only one antiepileptic drug because of co-existent epilepsy.⁵

Critical, as well, is a complete psychological, social and psychiatric assessment, with a definitive DSM-IV diagnosis, if any.¹¹ The full team--the epileptologist, psychologist, social worker, nurse, neuropsychologist, plus or minus the consulting psychiatrist—must be in agreement with the diagnosis/diagnoses. Who will present and how the diagnosis will be presented to the patient, plus or minus the family or significant other, should be determined in advance. Thorough preparation is key to an optimal presentation, thereby maximizing the chances of acceptance by the patient and family. Presentation of the diagnosis must be done in as non-judgmental and supportive manner as possible. Care must be taken to look for possible adverse reactions (from patient and family) to the presentation of the diagnosis, and that appropriate plans are made in preparation of a negative reaction.

It should be noted that some patients have an enhanced suicide risk after the diagnosis presentation, aggressive denial or, in some cases, a flight to health may ensue. The clinical scenario includes patients who too enthusiastically and readily endorse the diagnosis of non-epileptic seizures and, who can, within a 24- or 48-hour period, have a very significant deterioration in their psychological stability.¹²

Treatment of Non-epileptic Seizures

Treatment for non-epileptic seizures takes time. Aftercare needs must be arranged with an identified therapist who clearly understands the diagnosis; and a smooth transition must be organized. The patient must be given aegis. Patients and their families must be advised that non-epileptic events may continue for a time, but once a more effective and culturally acceptable coping strategy has been initiated, they will eventually disappear.

Humane treatment, however, has not always prevailed. In 1881¹³, Gowers wrote, “Cold water over the head is often successful if applied freely. In severe attacks a moderate quantity only excites redoubled violence while a second gallon is more effectual than the first.” Alternately, “A much more convenient and effectual remedy than water is strong faradization to the skin. Applied almost any where it will commonly quickly stop the attack.”

Obviously these are anachronistic, extremely insensitive approaches to treatment for the patient suffering non-epileptic seizures. Nonetheless, many neurologists and epileptologists, those steeped in the organic tradition, are dreadfully uncomfortable with psychologically mediated disorders and still harbor a significant component of, “Yes, that would be a nice simple solution, wouldn’t it?” Obviously, sensitivity to the patient, the utilization of a multidisciplinary team, and the recognition that psychogenic non-epileptic seizures is as devastating as is medically refractory epilepsy, is critical for a successful treatment outcome.

Ultimately, to be effective, treatment must be patient-customized and based on DSM-IV diagnostic grouping, when available.¹² Hopefully soon, some well-designed, large prospective outcome studies of treatment modalities for the non-epileptic patient will be performed.¹²

Consensus Perspectives

In April 1996, a conference titled “Non-epileptic Seizures: A Consensus Conference on Diagnosis and Treatment” was held in Bethesda, Maryland. During the Summary Discussion of the conference at Bethesda that resulted in the publication of the second edition of *Non-Epileptic Seizures*, edited by Gates and Rowan, some consensus perspectives were derived.¹⁴

From a neurological perspective, the universe of non-epileptic seizure physiologic events is large, including sleep, endocrine, neurologic and vascular disorders and is most problematic. Children offer a unique challenge, especially in their early years. Convulsive syncope is especially problematic because it can increase prolactin levels and have concomitant automatisms.

A consistent ratio of male:female for non-epileptic seizures of 1:4 in adults and 1:2 in children is observed. Under the age of 10, that ratio appears to be fairly even between the genders. Recurrent, stereotypic and inappropriate events may be a seizure/s and requires multiple recordings to tease out this threat of stereotypicity and to look carefully for surface EEG concomitant. An integrated multidisciplinary team approach is always preferred. Humility, and patience, is prudent on the part of the epileptologist, especially since epilepsy and non-epileptic seizures can co-exist in an average of 30% of patients.

Not all unusual epileptic events are frontal, but can have other sites of origin. There are suggestive features to help differentiate at the bedside. Atypical epileptic events for non-epileptic seizures, such as the atypical epileptic events being brief, frequent and a rapid discovery.

Neuropsychological and psychological aspects of non-epileptic seizures in adults confirm the age of onset to be predominantly in the 20s, a full scale IQ of approximately 92, average, but in the lower quartile of intellectual capability, a statistically significant lower

function on neuropsychological testing, and a significant incidence of depression. Other emotional or affective disturbances are frequent. As well, a curious observation of a significant neurological insult is reported in 80% of patients and confirmed by 46% of attending physicians. The MMPI does show an approximate 70-75% of patients experiencing the classic conversion V.¹² Scores on the Washington Psychosocial Inventory demonstrates there is not a significant difference between epilepsy patients and non-epileptic seizures patients, showing lower scores and probably just reflecting the significant impact of both disorders.¹²

Pediatric Non-epileptic Seizure Treatment

For pediatric patients, study sample sizes are small. The male to female ratio as previously discussed is 1:2, though probably 1:1 for children under 10 years of age. Comorbid epilepsy diagnosis in children is 22-38% as a consensus from the conference and from previous studies at 16-23%. Again, below average IQ not uncommon. School problems are reported in over 50% and history of sexual abuse is reported in 13-31%. Once psychosocial stressors are quantified, one or more stressors are present in 78-94% of pediatric patients and includes parental marital discord, parental psychopathology/alcohol abuse, parent/child conflict, learning and attention problems and/or lack of adequate peer support.

The assessment and treatment of the child should be viewed differently than that of an adult, taking into consideration family dynamics, parental functioning, environmental issues, and especially school and relationship with peers. There should be an emphasis on the meaning of the symptoms for the patient and family.

Psychiatric Aspects of Non-epileptic Seizures

Once psychiatric aspects are reviewed, it should be remembered that the incidence of seizures in female conversion patients is approximately 17%. The history of sexual abuse among the general population is quite high – for females 20-27%, males 3.5-16%, with serious abuse for females at 4.5% and 0.6% in males. In Bowman's study¹⁵ of 35 females and 23 males, 69% of females had a history of child abuse plus adult trauma, and 35% of the males had a syndrome of repressed anger plus enhanced life stresses. Alpers¹⁶ has developed a dissociative experience scale, demonstrating that non-epileptic seizure patients have derealization scale elevation and significant depersonalization. Barry¹⁷, utilizing a hypnosis strategy in non-epileptic seizure patients has found this to be 100% specific, 74% sensitive, with an incidence of depression (past or present) of over 60%.

Non-epileptic Seizures Treatment Consensus

Non-epileptic seizures are treatable, however there are only a few studies that have confirmed this, and further work in this area needs to transpire. Non-epileptic seizures

are easier to treat than is epilepsy, in the sense that the condition is potentially curable without heroic intervention, such as surgery. The diagnosis of NES needs to be confirmed and, there is a need to rule-out co-existing disorders. It is important to present the diagnosis to the patient and family in a supportive, matter-of-fact fashion. Therapy needs to be directed to the underlying cause. This includes appropriate treatment for depression, anxiety, psychosis and appropriately directed psychotherapy for issues of fear, rage, apathy and/or guilt.

Non-epileptic seizures are common, though the actual prevalence is unknown. Patients comprise a heterogenous population. Research in the area is quite embryonic, especially in the pediatric population. This disorder is very costly to society, though, again, no formal economic study has ever been performed. For the improved welfare of our patients, we need to direct research to formally study seizure sub-groups for prevention, treatment and prognosis of this condition.

End.

References

1. Schachter, SC, Brown F, Rowan AJ. Provocative testing for nonepileptic seizures: attitudes and practices in the United States among American Epilepsy Society members. *Journal of Epilepsy* 1996;9:249-252.
2. Betts T, Duffy N. Treatment of non-epileptic attack disorder (pseudoseizures) in the community. In: Gram L, Johannessen SI, Osterman PO, Sillanpää M, editors. Pseudo-epileptic seizures. Briston (PA): Wrightson Biomedical, 1993:109-21.
3. Gates JR. Part summary: neurologic aspects of non-epileptic seizures in the adult and pediatric patient. In: Gates JR, Rowan AJ, editors. Non-epileptic seizures, 2nd ed. Boston: Butterworth-Heineman, 2000:111-12.
4. Scott DF. Recognition and diagnostic aspects of nonepileptic seizures. In: Riley TL, Roy A, eds. Pseudoseizures. Baltimore: Williams & Wilkins Co., 1982:21-24.
5. Sigurdardottir KR, Olafasson E. Incidence of psychogenic seizures in adults: a population-based study in Iceland. *Epilepsia* 1998;39:749-752.
6. Gates JR. Epidemiology and classification of non-epileptic events. In: Gates JR, Rowan AJ, editors. Non-epileptic seizures, 2nd ed. Boston: Butterworth-Heineman, 2000:3-14.
7. Gates JR, Ramani V, Whalens SM. Ictal characteristics of pseudoseizures. *Arch Neurol* 1985;42:1183-7.
8. Devinsky O, Donofrio N, Perrine K, Alper KR. Depression and anxiety in patients with non-epileptic versus epileptic seizures. 151-157.
9. Gates JR. Part summary: Neurologic aspects of non-epileptic seizures in the adult and pediatric patient. In: Gates JR, Rowan AJ, editors. Non-epileptic seizures, 2nd ed. Boston: Butterworth-Heineman, 2000:111-112.
10. Gates JR. Clinical observation.
11. Martin RL, Gates JR. Nosology, classification, and differential diagnosis of non-epileptic seizures: an alternative proposal. In: Gates JR, Rowan AJ, editors. Non-epileptic seizures, 2nd ed. Boston: Butterworth-Heineman, 2000:253-267.
12. Risse GL, Mason SL, Mercer DK. Neuropsychological performance and cognitive complaints in epileptic and non-epileptic seizure patients. In: Gates JR, Rowan AJ, editors. Non-epileptic seizures, 2nd ed. Boston: Butterworth-Heineman, 2000:139-150.
13. Gowers W. Epilepsy and other chronic convulsive diseases: their causes, symptoms and treatment. New York: Dover Publications, 1964.
14. Gates JR, Rowan AJ. (eds) Non-epileptic seizures, 2nd ed. Boston: Butterworth-Heineman, 2000. Non-epileptic seizures, 2nd ed. Boston: Butterworth-Heineman: 2000.
15. Bowman ES. Relationship of remote and recent life events to the onset and course of non-epileptic seizures. . In: Gates JR, Rowan AJ, editors Non-epileptic seizures, 2nd ed. Boston: Butterworth-Heineman, 2000:285-294.
16. Alper KR. Non-epileptic seizures as a paradigm for research on historical theories of conversion. . In: Gates JR, Rowan AJ, editors. Non-epileptic seizures, 2nd ed. Boston: Butterworth-Heineman, 2000: 285-294.

17. Barry JJ, Atzmon O. Use of hypnosis to differentiate epileptic from non-epileptic events. In: Gates JR, Rowan AJ, editors Non-epileptic seizures, 2nd ed. Boston: Butterworth-Heineman, 2000:295-304.