



Case Report

The diagnostic and therapeutic challenge of nonepileptic seizures: An interdisciplinary approach

Shirley Ferguson Rayport ^{*,1,2}, Carolyn A. Schell ^{2,3}

Medical College of Ohio (currently University of Toledo), Toledo, OH, USA



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ABSTRACT

Nonepileptic seizures were recognized in antiquity, but their diagnosis continues to be challenging in the present day. The diagnosis of seizures as nonepileptic has been based on associated physical conditions, social factors, laboratory findings, or psychological test findings. Pitfalls remain in the use of electroencephalography. We present several case studies of representative etiologies that demonstrate the value and the need for an interdisciplinary approach focusing on the individual, in the present, in all current dimensions, with careful consideration of seizure phenomena, physical explanations for symptoms, and psychodynamic profile in order to make the diagnosis and formulate successful treatment. This interdisciplinary approach provides a more comprehensive understanding of nonepileptic seizures and, more often, leads to successful outcome.

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1. Introduction

Recognized in antiquity, uncertainties about both the diagnosis and treatment of nonepileptic seizures (NESs) continue to this day [1–5]. The term NES refers to a “wide variety of disorders that are mistaken for epilepsy but which are due to causes other than abnormal discharges in the brain” [6]. Over the last decades, investigators have sought related conditions or factors to substantiate a diagnosis of NES. Their methodology has been to compare patients with epileptic seizures (ESs) and those with NESs in regard to physical, psychiatric, psychosocial, psychological, and/or laboratory findings [7–13]. These factors are of questionable value since they are distant from the interface of the epileptic-like phenomena and the probable etiology of the NES that may be due to either the neurological or psychodynamic state in each patient.

Electroencephalography (EEG) contributes greatly to accurate differentiation. However, since the ES is an intermittent phenomenon, a negative tracing may occur in a patient with epilepsy and, therefore, would not necessarily differentiate ESs from NESs. Electroencephalography misinterpretations [14] are not uncommon in patients with undiagnosed NES [15]. Video electroencephalography (VEEG), thought to provide the gold standard for making a correct diagnosis of ES, has limitations [14]. This procedure is not available everywhere [16,17]

and is expensive [14,18,19]. In practice, it is usually reserved for the patient with intractable partial epilepsy to obtain a more accurate definition of the site of the seizure focus.

Many current investigators attempt to utilize and evaluate a specific treatment modality, such as pharmacotherapy or cognitive behavioral therapy, for every patient with a diagnosis of NES [7,20]. At a well-regarded workshop on treatment of NESs in 2005, the authors concluded that, “validated treatments and controlled trials are lacking” [21]. Through case reports of successful treatment of NESs in an interdisciplinary epilepsy program, now informed by significant temporal perspective, we highlight the possibility of more accurate diagnosis and, subsequently, more successful treatment of NESs, as well as recognition of brain-driven seizures, previously portrayed as nonepileptic, when neuropsychiatric epileptological exploration is joined with neurological and neurological surgery evaluations. Rather than seeking a single treatment for NESs, we support an interdisciplinary case-oriented approach in which the evaluation and subsequent treatment of each patient is provided by a team of specialists – a neurologist, a neurosurgeon, and a neuropsychiatrist – who see each patient at each clinic visit and in long-term follow-up.

2. Material and methods

We have addressed the challenge of diagnostic uncertainty by utilizing an interdisciplinary approach that focuses on the vicissitudes of the patient's history [22,23]. Recognizing the crossover of neurologic and psychiatric domains, this requires the joint efforts of a behavioral neurologist/neurosurgeon and a neuropsychiatrist in formulating the diagnosis. The neurological/neurosurgical and neuropsychiatric

* Corresponding author at: The University of Toledo-College of Medicine and Life Sciences, Department of Psychiatry, MS #1193, 3000 Arlington Avenue, Toledo, OH 43614-2598, USA. Tel.: +1 419 874 3194; fax: +1 419 383 8183.

¹ Professor Emerita of Neuropsychiatry

² Comprehensive Epilepsy Center

³ Former Nurse Coordinator

clinicians follow patients longitudinally, comparing evaluations after each clinic session. In addition, the same group participates in the VEEG monitoring and Wada testing, with sharing of observations after each session.

This interdisciplinary approach maintains a focus on the individual patient's seizure history, present manifestations, neurological findings, and related psychodynamics, rather than on a diagnostic entity, leading to a treatment approach that reliably achieves cessation of NESs.

3. Results

Through representative case examples, we illustrate the power of the interdisciplinary approach to NESs, highlighting the varied etiology of NESs, including pathophysiologic, psychopathologic, or ESs mistakenly characterized as NESs. Each case describes a possible diagnosis, neurological or psychiatric. Discerning the etiology determines the course of treatment. One or two cases are presented in each category.

3.1. NESs thought to be epileptic in an individual with clear 'seizure'-related psychodynamics

A 34-year-old man was referred to the Comprehensive Epilepsy Center for epilepsy surgery because of focal seizures, which were unresponsive to antiepileptic drugs (AEDs). Neuropsychiatric history revealed that the first seizure had occurred 4–5 years previously when the patient, then 30, was in a hospital recovery room, after undergoing minor surgery. The patient described his episodes as follows: "I start shivering and shaking. Then, I feel lightheaded, I have a headache, and, my stomach hurts. I go into it real deeply and I don't remember. Afterwards, I have a worn out feeling." He often loses time at work or goes to an emergency room.

The neurologist found that the 'seizure' manifestations were not consonant with a brain-driven condition, either on clinical observation or on EEG recording. The neuropsychiatrist obtained the following history: While his father was away in the service, the patient came home from school one day to find his mother and his three-year-old brother dead, as the result of a gas leak. His father returned, and, after a time, remarried. The patient had a poor relationship with his stepmother and was neglected. He had an early memory of difficulty: "I had to grab the railing to get into the classroom." His father was an excessive drinker who never paid his son sufficient attention. The patient's wife corroborated this evidence of blatant emotional deprivation and emphasized that through the years, even when the patient was ill, the family was never present. For example, "They were not there, even when he had to undergo surgery." The patient's marriage of 10 years was satisfactory, except for a lack of children. Seven years previously, the couple had lost a child at eight months gestation as a result of placenta previa. There was no subsequent pregnancy as the wife considered herself then too old to have a child. Recently, there had been the threat of loss of his job, after 16 years of employment.

The diagnosis reached by the neurologist and the neuropsychiatrist was NES. The neurologist had found the attacks unsustainable as neurologic events. The neuropsychiatrist had established a convincing psychodynamic profile with attacks occurring in response to major stress, which revived long-standing feelings of deprivation. The neurologist maintained contact with the patient while discontinuing antiepileptic medication, and the patient was well established in a psychotherapeutic relationship. The psychotherapy, which the patient had never received but long needed, addressed the emergent psychopathology. In addition to individual help, it was suggested that the couple be seen together for counseling, in regard to loss of the child and the patient's emotional needs. Over a period of months, the NES ceased, and the patient was able to recognize and resolve his long-standing feelings of anger and need for understanding. He achieved a more positive outlook. His wife, after becoming involved in the therapy, was able to serve more actively as the supportive figure he had always needed.

3.2. NESs misdiagnosed as epilepsy due to a subtle developmental disorder

A 26-year-old single man was admitted to the hospital because of an episode at work. He had become angry and anxious, and, then, disorganized and intemperate; his behavior led to dismissal and, shortly thereafter, admission to the hospital.

In regard to history, the patient stated that one year previously, he had been considered 'epileptic' and was given AEDs. He described his seizures as consisting of jerking movements in his right hand and arm. The neurologist elicited a history of increasing difficulty with ordinary tasks and, on examination, evidence of cognitive dysfunction. The patient was diagnosed as having degenerative brain disease, and a brain biopsy was considered. The neuropsychiatrist obtained a history of learning difficulties from childhood. Examination revealed impairments of higher functions causing him to fail on several occasions when he would be promoted at work but was unable to cope with new responsibilities. The neuropsychiatrist made a diagnosis of NES, with subtle developmental disorder (not degenerative brain disease).

The neurologist and neuropsychiatrist worked together – the neurologist discontinuing AEDs and the neuropsychiatrist initiating supportive psychotherapy, with reassurance, education about the seizures, and guidance to appropriate work, with the assistance of the team vocational counselor. Brain biopsy was definitely not indicated. The patient remained in psychotherapy for a few months, until the seizures ceased, and he became established in a suitable work situation and felt confident enough to proceed on his own. After discharge, he was encouraged to contact the therapist if any problems should arise.

3.3. NESs due to a headache syndrome

A 25-year-old male patient was referred to the Comprehensive Epilepsy Center for treatment of 'temporal lobe seizures.' The patient stated that several years previously, he started to have aggressive outbursts, attacking people or things. Both the neurologist and the neuropsychiatrist determined that his aggressive behavior clearly occurred in response to severe unilateral headache, with eye pain and tearing. A diagnosis of cluster headache was established. A thorough history obtained by both disciplines led to the correct diagnosis of a treatable condition and abandonment of the diagnosis of epilepsy. The neurologist initiated pharmacotherapy of the headaches. Over a number of months, the headaches were eliminated, as well as the aggressive outbursts.

3.4.1. Epileptic seizures thought to be NESs (first case)

A 53-year-old woman was referred for evaluation of her 20-year history of symptoms, of which she had been told that, "It's all in your head." She had remained protected, isolated, and unfulfilled in her personal life. The pattern of her episodes was described by the patient and by family members. At the beginning of an episode, she would experience "a funny feeling in my stomach. I cringe and fold my arms over my stomach and I rock." Subsequently, out of contact, she may undress inappropriately, grab people, pull their hair, or bite someone's hand and cry: "help me, help me." On recovery of awareness, she has some confusion, including recognition of her whereabouts. The neurologist and neuropsychiatrist, both familiar with seizure patterns, recognized the manifestations of brain-driven seizure activity, consistent with a temporal lobe seizure pattern. Video electroencephalography confirmed the clinical impression with EEG findings of a focus in the right mesial temporal lobe.

Treatment began with a trial of AEDs. After failure of several drugs, the case was reviewed by the neurosurgeon who recommended excision of the epileptogenic focus. During neurosurgery, intraoperative electrocorticography further confirmed the site of the focus, which was excised. Neuropsychiatric support was provided during the trial of AEDs and during and after surgery. Interdisciplinary follow-up continued over the years, as is usual in the epilepsy program, as she transitioned

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