

Seizure-like episodes, but is it really epilepsy?

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Ms. N, age 12, experiences paroxysmal episodes of pain, weakness, and muscle spasms. She has no history of seizures, and an initial EEG is inconclusive. What could be causing these episodes?

CASE Increasingly frequent paroxysmal episodes

Ms. N, age 12, comes to the hospital for evaluation of paroxysmal episodes of pain, weakness, and muscle spasms. A neurologist who evaluated her as an outpatient had recommended a routine electroencephalogram (EEG); after those results were inconclusive, Ms. N's mother brought her to the hospital for a 24-hour video EEG.

Ms. N has a history of asthma. She has no history of seizures or headache, but her mother has an unspecified seizure disorder that has been stable with antiepileptic medication for many years. Ms. N has no other family history of autoimmune or neurologic disorders.

Ms. N's episodes began 6 months ago and have progressively increased in frequency from 5 to 12 episodes a day. She says that before she has an episode, she "feels tingling in her fingers and mouth, and butterflies in her belly," and then her "whole body clenches up." She denies experiencing tongue biting, facial or extremity weakness, incontinence, or loss of consciousness during these episodes.

Shortly before her hospitalization, Ms. N had won a scholarship to attend an overnight art camp. Because her episodes were becoming more frequent and their etiology remained unclear, Ms. N and her mother decided it would be unsafe for her to attend, and that she should go to the hospital for evaluation instead.

EVALUATION Tough questions reveal answers

The pediatric team evaluates Ms. N. Her physical exam, laboratory values, and imaging are all within normal limits. Her neurologic exam demonstrates full strength, tone, and sensation in all extremities. All cranial nerves and reflexes are intact. No dysmorphic features or gait abnormalities are noted. All laboratory and imaging tests are normal, including complete blood cell count, electrolytes, calcium, magnesium, phosphorus, glucose, creatine kinase, liver enzymes, urine drug screen, human chorionic gonadotropin (hCG) urine test, and head CT.

After the initial workup, the pediatric team consults the child and adolescent psychiatry team for a complete assessment of Ms. N due to concerns that a psychological component is contributing to her episodes. According to the psychosocial history obtained from Ms. N and her mother, Ms. N had experienced disrupted attachment, trauma, and loss. At age 5, Ms. N was temporarily removed from



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her mother's custody after a fight between her mother and brother. At age 9, Ms. N's stepfather, her primary father figure, died of a brain tumor.

Ms. N also has significant trauma stemming from her relationship with her biological father. Ms. N's mother reports that her daughter was conceived during nonconsensual sexual intercourse. Ms. N did not have much contact with her biological father until 6 months ago, when he started picking her up at school and taking her to his home for several hours without permission or supervision. Afterwards, Ms. N confided to her mother and a teacher that her father sexually assaulted her during those visits.

Ms. N and her mother reported the assault to the police and were awaiting legal action.

During the interview with the psychiatry team, Ms. N denies that any thoughts or actions trigger the episodes and reports that she cannot control when they happen. Because she cannot anticipate the episodes, she says she is afraid to leave her house. She does not know why the episodes are happening and feels frustrated that they are getting worse. Ms. N says, "I have been feeling down lately," but she denies hopelessness, worthlessness, suicidal ideation, homicidal ideation, delusions, or hallucinations.

In the hospital, when the psychiatry team asks Ms. N about her visits with her father, she says that they are "too painful to talk about," and fears that discussing them will trigger an episode. However, her mother suggests that her daughter's sexual trauma, as well as ongoing frustrations with the legal system, are influencing her mood; she has had low energy, poor appetite, and is spending more time in bed. Her mother also reports that Ms. N "avoids going out in the sun and spending time with her friends outside. She doesn't seem to enjoy shopping and art like she used to." Ms. N told her mother that she was having nightmares about the trauma and "could not stop thinking about some of the bad stuff that happened during the day."

Ten minutes into the interview, while being questioned about her father, Ms. N experiences a spastic episode. She curls up in bed on her left side, clenches her entire body, and shuts her eyes. Her mother quickly runs to her bedside and counts the seconds until the end of the episode. After 25 seconds, Ms. N awakes with full recollection of the episode. On review of the video EEG during the episode, no ictal patterns are seen.

What is the most likely diagnosis for Ms. N?

- epilepsy
- nonepileptic seizure
- intracranial mass
- hemiplegic migraine

The authors' observations

Paroxysmal episodes of weakness, numbness, and muscle spasms in a young female are suggestive of either epilepsy or nonepileptic seizure (NES).^{1,2} The negative EEG and physical features are inconsistent with epileptiform seizure, and Ms. N's history and evaluation are suggestive of NES. Nonepileptic seizures are a type of a conversion disorder, or functional neurologic symptom disorder, in which a patient experiences weakness, abnormal movements, or seizure-like episodes that are inconsistent with organic neurologic disease.³ When a diagnosis of conversion disorder is suspected, a clinician must always consider other pathology that can explain the symptoms, such as migraine, vasovagal syncope, or intracranial mass. If a patient has focal neurologic deficits, head imaging should be pursued. Additionally, the clinician must screen for malingering and factitious disorder before establishing a definitive diagnosis. However, conversion disorder is not a diagnosis of exclusion. For example, a negative EEG does not rule out epilepsy, and patients can have both epilepsy and concomitant NES.

Although NES is a common type of conversion disorder, it is often difficult to diagnose, manage, and treat. Patients often

Clinical Point

Conversion disorders are a presentation of neurologic symptoms that cannot be readily accounted for by other conditions

Table

Prognostic indicators for nonepileptic seizure

Positive prognostic factors	Negative prognostic factors
Independent lifestyle	Comorbid psychiatric condition
Employment	Sexual abuse
Young age of onset	Pending litigation
Strong family and social support	Coexisting epilepsy
Depersonalization	Low education level
Acceptance/understanding of diagnosis	Lack of understanding the condition

Source: Reference 16

Clinical Point

A video EEG without ictal patterns before, during, and after an observed episode is diagnostic of NES

receive antiepileptic medications but continue to have worsening events that are refractory to treatment. Various clinical features can suggest NES instead of epilepsy. Forced eye closure on video recording is a specific finding suggestive of NES, yet this feature is not sufficient to make the diagnosis.⁴ A video EEG must be performed to assess for epilepsy. The diagnosis of NES does not exclude the possibility that a patient has epilepsy, as NES can occur in up to 40% of patients with epilepsy.⁵ A video EEG without ictal patterns before, during, and after an observed episode is diagnostic of NES.⁶

Which of the following factors may increase the likelihood of nonepileptic seizure?

- history of seizure disorder
- incestuous sexual abuse
- stressful family relationships
- loss of multiple loved ones
- comorbid psychiatric conditions, such as anxiety, depression, and posttraumatic stress disorder (PTSD)

The authors' observations

Conversion disorders such as NES are a presentation of neurologic symptoms that cannot be readily accounted for by other conditions and are often associated with antecedent trauma. Multiple factors in Ms. N's history increase her risk of NES, including loss of multiple loved ones,

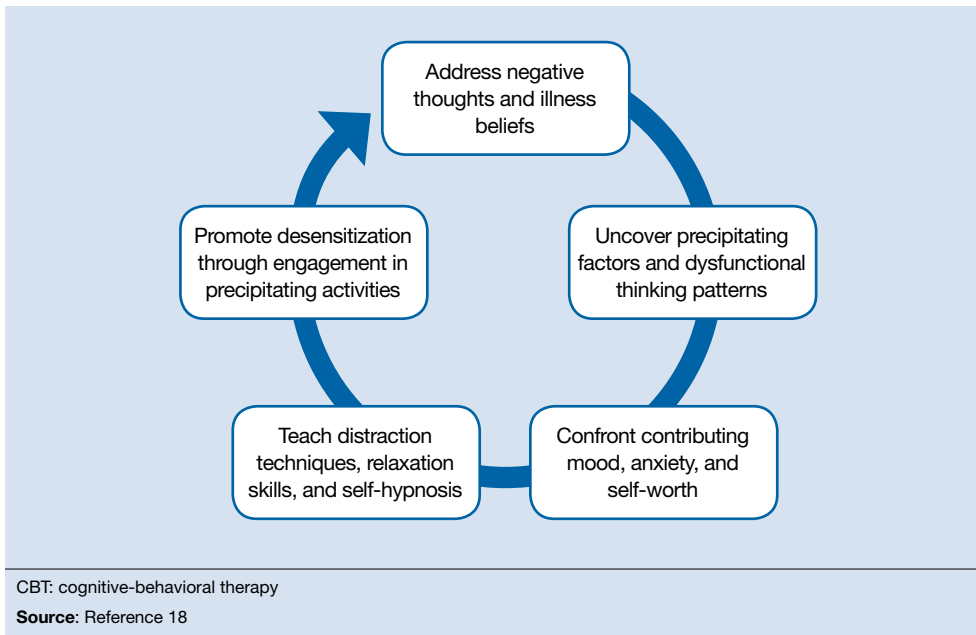
ongoing legal involvement, and alleged sexual abuse by her father.

Victims of sexual abuse are more likely than the general population to demonstrate symptoms of conversion disorder, especially NES.^{7,8} The onset of paroxysmal episodes after incestuous abuse in a teenage girl is characteristic of NES. Compared with patients with complex partial epilepsy (CPE), patients with NES are 3 times more likely to report sexual trauma.^{9,10} Children who report sexual abuse that precedes NES are more likely to have been victimized by a first-degree relative than patients with CPE who report sexual abuse.¹¹ Risk factors for victims developing NES may be related to the severity of adversity, stress sensitivity, and decreased hippocampal volume.^{12,13}

Ms. N endorsed many psychiatric symptoms that accompany her paroxysmal episodes; this is similar to findings in other patients with NES.¹⁴ One study found that depression is 3 times more prevalent and PTSD is 8 times more prevalent in patients with NES.¹² During the evaluation, Ms. N's mother said her daughter had low energy, poor appetite, lethargy, and anhedonia for the preceding 5 months, which is consistent with adjustment disorder.³ Her flashbacks, nightmares, difficulty sleeping, and agoraphobia, along with her trouble engaging with the people and activities that used to bring her joy, are symptoms of PTSD. Nonepileptic seizure is often associated

Figure

CBT techniques for nonepileptic seizure

**Clinical Point**

CBT is currently the treatment of choice for reducing seizure frequency in patients with NES

with PTSD and can be viewed as an expression of a dissociated subtype.¹⁵

In a literature review, Durrant et al¹⁶ isolated prognostic indicators for NES (Table,¹⁶ page 44). This study found that 70% of children and 40% of adults achieve remission from NES. Ms. N's case has multiple concerning features, such as her comorbid psychiatric conditions, ongoing involvement in a legal case, and sexual trauma; this last factor is associated with the most severe symptoms and worse outcomes.^{16,17} Despite this somber reality, Ms. N has the support of her mother and is relatively young, which play a vital role in recovery.

TREATMENT A strategy for minimizing the episodes

Ms. N's medical workup remains unremarkable throughout the rest of her hospital stay. The psychiatry and pediatric teams discuss their assessments and agree that NES is the most likely diagnosis. The psychiatry team

counsels Ms. N and her mother on the diagnosis and etiology of NES.

Which treatment would you initiate to address Ms. N's episodes?

- antiepileptic medication
- standard medical care
- cognitive-behavioral therapy (CBT) with medication
- CBT without medication

The authors' observations

Cognitive-behavioral therapy is currently the treatment of choice for reducing seizure frequency in patients with NES.^{18,19} The use of CBT was suggested due to the theory that NES represents a dissociative response to trauma. Therapy focuses on changing a patient's beliefs and perceptions associated with attacks.⁵ A randomized study of 66 patients with NES compared the use of CBT plus standard medical care with standard medical care alone.¹⁸ The standard medical care consisted of supportive treatment,

Clinical Point

In addition to CBT, studies of psychodynamic psychotherapy for NES have had promising findings

an explanation of NES from a neuropsychiatrist, and supervised withdrawal of antiepileptic drugs. The CBT treatment group was offered weekly hour-long sessions for 12 weeks, accompanied by CBT homework and journaling the frequency and nature of seizure episodes (the CBT techniques are outlined in the *Figure*,¹⁸ page 45). After 4 months, the CBT treatment group had fewer seizures, and after a 6-month follow-up, they were more likely to be seizure-free. However, in this study, CBT treatment did not improve mood or employment status.

A later investigation looked at using selective serotonin reuptake inhibitors to treat NES in adults.¹⁹ This study divided participants into 4 treatment groups: CBT with informed psychotherapy (CBT-ip), CBT-ip plus sertraline, sertraline alone, and treatment as usual. Sertraline was titrated up to a dose of 200 mg/d as tolerated. After 16 weeks of sertraline alone, seizure frequency did not decrease. Although both CBT groups showed a reduction in symptoms of up to 60%, the CBT-ip group reported fewer psychiatric symptoms with better social interactions, quality of life, and global functioning compared with patients treated with CBT-ip plus sertraline. The authors suggested that this may be due to the somatic adverse effects associated with sertraline. This study suggests that CBT without medication is the treatment of choice.

In addition to CBT, studies of psychodynamic psychotherapy for NES have had promising findings.²⁰ Psychodynamic psychotherapy focuses on addressing conscious and unconscious anger, loss, feelings of isolation, and trauma. Through improving emotional processing, insight, coping skills and self-regulation, patients often benefit from an improvement in seizures, psychosocial functioning and health care utilization.

Metin et al²¹ found that group therapy alongside a family-centered approach elicited a strong and durable reduction in

seizures in patients with NES. At enrollment, investigators distributed information on NES to patients and families. Psychoeducation and psychoanalysis with behavior modification techniques were provided in 90-minute weekly group sessions over 3 months. Participants also underwent monthly individualized sessions for standard psychiatric care for 9 months. During the group sessions, operant conditioning techniques were used to prevent secondary gain from seizure-like activity. Families met 4 times for 1 hour each to discuss seizures, receive psychoeducation on a subconscious etiology of NES, and learn behavior modification techniques. All 9 participants who completed group and individual therapy reported a significant and sustained reduction in seizure frequency by at least 50% at 12-month follow-up. Patients also demonstrated improvements in mood, anxiety, and quality of life.

A meta-analysis by Carlson and Perry²² that included 13 studies and 228 participants, examined different treatment modalities and their effectiveness for NES. They found that patients who received psychological intervention had a 47% remission rate and 82% improvement in seizure frequency compared with only 14% to 23% of those who did not receive therapy. They postulated that therapy for this illness must be flexible to properly address the socially, psychologically, and functionally heterogeneous patient population. Although there are few randomized controlled trials for NES to determine the best evidence-based intervention, there is now consensus that NES has a favorable prognosis when barriers to psychological care are eliminated.

OUTCOME Referral for CBT

The treatment team advises Ms. N to engage in outpatient therapy after discharge from the hospital. Ms. N and her mother agree to the treatment plan, and leave the hospital with a referral for CBT the next day.

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Related Resources

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Drug Brand Name

Sertraline • Zoloft

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Clinical Point

NES has a favorable prognosis when barriers to psychological care are eliminated

Bottom Line

Nonepileptic seizure (NES) is a type of conversion disorder characterized by seizure-like episodes without ictal qualities. Risk factors for NES include concomitant epilepsy, psychiatric disorders, unstable psychosocial situations, and antecedent trauma. Patients with a history of incestuous sexual abuse are most at risk for developing NES. A normal EEG that fully captures a seizure-like episode is diagnostic of NES. Cognitive-behavioral therapy can minimize seizure frequency and intensity.