PSYCHIATRIC DISORDERS IN EPILEPSY

Management of psychogenic nonepileptic seizures

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SUMMARY

The International League Against Epilepsy (ILAE) Neuropsychobiology Commission gave the charge to provide practical guidance for health professionals for the pharmacologic and nonpharmacologic treatment of patients with psychogenic nonepileptic seizures (PNES). Using a consensus review of the literature, an international group of clinician-researchers in epilepsy, neurology, neuropsychology, and neuropsychiatry evaluated key management approaches for PNES. These included the following: presentation of the diagnosis, early phase treatment, psychological and pharmacologic interventions, and maintenance management. The aim of this report is to provide greater clarity about the range and current evidence base for treatment for patients with PNES, with the intention of improving the care of patients with PNES and patients who develop PNES as a comorbidity of epilepsy.

KEY WORDS: Psychogenic nonepileptic seizures, Epilepsy, Differential diagnosis, Electroencephalography, Video electroencephalography monitoring, Treatment, Pharmacotherapy, Psychotherapy.

The International League Against Epilepsy (ILAE) and its national affiliates, U.S. and United Kingdom research funding agencies (National Institutes of Health [NIH] and National Institute of Healthcare Research [NIHR]), and Epilepsy Foundations are increasingly paying attention to seizure disorders other than epilepsy and the comorbidities of epilepsy (Kelley et al., 2009). The ILAE supported an expert consensus report on management of neuropsychiatric conditions in epilepsy (Kerr et al., 2011). Included in the conditions described are nonepileptic seizures (NES) and, more specifically, psychogenic nonepileptic seizures (PNES). Given the absence of a fully powered randomized controlled treatment trial for patients with PNES, national funding agencies are now devoting resources to develop much needed treatments for the condition.

The ILAE Neuropsychiatry of Epilepsy consensus document provides an outline of management recommendations for PNES based on the best-known approaches in the field, observational data, and expert recommendations (LaFrance & Devinsky, 2002; Kerr et al., 2011). Having produced a much more detailed report on the investigation and diagnosis of patients with PNES (LaFrance et al., 2013a), the ILAE Neuropsychobiology Commission asked a committee of internationally recognized experts to produce a more detailed report on the treatment of PNES. A summary of the best current practice of the management of PNES compiled by these experts was then reviewed by the members of the ILAE Neuropsychobiology Commission. This article is the outcome of this international collaboration process. Its purpose is to provide specific recommendations for the management for patients with PNES. Management of PNES is divided into four stages; making the diagnosis, presenting the diagnosis, gaining control of the seizures, and management of seizures and life activities.

MAKING THE DIAGNOSIS

Best-practice diagnosis should include video-electroencephalography (vEEG) (video telemetry) for each individual with suspected PNES, as well as patients with refractory or pharmacoresistant seizures.

Patients with persistent seizures are often treated with antiepileptic drugs (AEDs) for presumed epilepsy in monotherapy or polytherapy. Of the 1% of the U.S. population diagnosed with epilepsy, 5–20% actually have PNES (LaFrance & Benbadis, 2006). Predictors of PNES

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include "the rule of 2s," which includes at least two normal electroencephalography (EEG) studies, with at least two seizures per week, resistance to two antiepileptic drugs (AEDs), yielding an 85% positive predictive value for PNES (Davis, 2004). Although characteristic features of ictal semiology may help distinguish epileptic seizures from PNES (Devinsky et al., 2011), vEEG remains the gold standard for the diagnosis of epilepsy and PNES, and is a test that allows clinicians to establish the diagnosis with a high level of confidence and reliability (Syed et al., 2011). Accurate diagnosis is an essential aid to subsequent management.

It is recognized that vEEG monitoring (inpatient or ambulatory EEG with video) is not available throughout the world. Moreover, inpatient vEEG may not be practical in patients with infrequent events, and for patients whose seizures occur only in circumstances unlike those found in a clinical monitoring environment, ambulatory EEG with video may not be accessible. This means that the diagnosis may be arrived at using a combination of history, semiology of the witnessed event, normal routine ictal and interictal EEGs, and a lack of elevated prolactin within 30 min of an apparent generalized tonic–clonic seizure. The relative diagnostic value of these diagnostic techniques and the level of diagnostic certainty that results from their use are described in depth in the recently completed ILAE commissioned paper mentioned above (LaFrance et al., 2013a). The "take home message" is that establishing the diagnosis of PNES, as securely as possible, is the first step in treatment of patients with PNES.

PRESENTING THE DIAGNOSIS

In most cases the diagnosis is likely to be communicated by a neurologist. The majority of neurologists accept that the explanation of PNES is part of their role (LaFrance et al., 2008; Mayor et al., 2011), although an early involvement of mental health professionals has also been suggested (Harden & Ferrando, 2001). No research has been undertaken to establish whether it is effective to involve the patients' family members in the discussion of the diagnosis. However, having family members present during the presentation may facilitate understanding, as described later.

Doctors may feel they face a challenge when communicating the diagnosis of PNES. As a group, patients with PNES have experienced more negative life events prior to the development of their seizures than patients who have just developed epilepsy, but they are less likely to accept that these experiences could be relevant to the etiology of their seizure disorder (Binzer et al., 2004). Patients with PNES have an (even more) external health related locus of control than those with epilepsy (Stone et al., 2004). They are more aware of seizure-associated physical (than emotional anxiety) symptoms and may report symptoms

characteristic of autonomic arousal without recognizing possible subjective emotional experiences associated with these symptoms (Goldstein & Mellers, 2006). In keeping with this, patients with PNES score highly on self-report scales of alexithymia (i.e., indicating difficulty understanding, processing, or describing emotions), although not in a manner that easily distinguishes them from patients with epilepsy (Tojek et al., 2000; Bewley et al., 2005).

Unlike patients, neurologists perceive PNES as a largely or entirely "psychological" problem (Whitehead & Reuber, 2012). They consider psychotherapy the treatment of choice for those patients who fail to improve with the communication of the diagnosis (LaFrance et al., 2008, 2012; Mayor et al., 2011).

A number of studies have shown how complex the conversations can be, in which neurologists try to "convince" patients with PNES of their own understanding of their disorder. One showed that almost all patients display resistance to the doctor's attempts to link their apparently physical problem to emotional causes or adverse life events (Monzoni et al., 2011a). Another demonstrated that neurologists seem to anticipate this and treat the communication of the diagnosis of PNES (and that of other "functional" neurological problems) as highly problematic, perhaps provoking patients' resistance and contributing to patients' confusion in the process (Monzoni et al., 2011b). Clinical experience suggests that the clinician's comfort level with explaining a somatoform disorder diagnosis is likely to impact the acceptance by the patient and their family.

However, there is increasing evidence that the process of communicating the diagnosis is a very important and potentially effective therapeutic step in the management pathway of patients with PNES. The number of PNES was reduced in the 24 h after the diagnosis was explained in one study (Farias et al., 2003). However, in contrast to the finding of immediate PNES reduction, the 1-year follow-up showed persistence of seizures in 87% of patients (Wilder et al., 2004). Several retrospective studies suggest that about one third of patients will report that PNES have stopped when asked 3–6 months after diagnosis with no further intervention (Aboukasm et al., 1998; Kanner et al., 1999; Arain et al., 2007). A prospective single-center audit showed that nearly one half of patients with recent-onset seizures were PNES-free 6 months after the diagnosis. Most patients who became PNES-free stopped having seizures immediately after the explanation of the condition (McKenzie et al., 2010; Duncan et al., 2011). Likewise, one prospective multicenter study confirmed that PNES can cease with the explanation of the diagnosis alone—although in this study only 16% of patients were PNES free at 6 months of follow-up (Mayor et al., 2010).

So far it is uncertain which patients are particularly likely to stop having PNES with the communication of the

diagnosis alone. However, predictors of persistence of seizures include depression, personality disorder, and abuse history (Kanner et al., 1999). Proposed predictors of PNES cessation include recent onset, the absence of comorbid anxiety, depression, personality disorder or abuse history, and continued employment at the time of diagnosis/lack of reliance on state financial benefits. It may be that the level of diagnostic certainty at the time of the explanation of the diagnosis is relevant. Whereas the diagnosis had been proven by vEEG in almost all patients in the study by Duncan et al. (2011), (McKenzie et al., 2010), about one half of the patients in the study by Mayor et al. (2010) had diagnoses based on clinical features alone.

The communication of the diagnosis seems to have an even more impressive immediate effect on healthcare utilization than on seizure control. Several studies have demonstrated reductions in health care expenditure overall or in the use of emergency services more specifically (Martin et al., 1998; McKenzie et al., 2010; Razvi et al., 2012). Of interest, reductions in emergency service use were even seen in those patients who continued to experience PNES (McKenzie et al., 2010).

It is important to note that even patients whose PNES stop (at least temporarily) after the explanation of the diagnosis may still need further active psychological or psychiatric treatment. Across the whole PNES patient group, the impact of the explanation of the diagnosis on measures of psychological distress, functioning, or health-related quality of life is not impressive. The biggest prospective study of this issue showed no significant change in self-report measures after 6 months, even when PNES had improved or stopped (Mayor et al., 2012b). However, the risk of developing other somatoform problems when PNES have ceased may be smaller than often thought (at least in the short term) (McKenzie et al., 2011).

Several studies have demonstrated that the explanation of the diagnosis of PNES may also have adverse consequences. Many patients' seizures do not experience a sustained improvement of their PNES with the relaying of the diagnosis. They may even show an increase in PNES frequency or experience an exacerbation of other mental health symptoms following delivery of the diagnosis. The likelihood of engaging patients in further treatment (such as psychological therapy) may be reduced if the explanation of the diagnosis received leaves the patient angry or confused (Carton et al., 2003; Thompson et al., 2009).

To maximize the possibility of a positive outcome and to reduce the risk of an ineffective discussion, four reasonably detailed communication strategies have been published (see Table 1) (Shen et al., 1990; Mellers, 2005; Duncan, 2010; Hall-Patch et al., 2010). If PNES had been captured by vEEG, all proposed strategies would begin with a search for confirmation that the recorded events were typical of the patient's habitual events. The strategy proposed by Shen also involves clinicians showing patients and caregivers a video-recording of the PNES prior to delivering the explanation of the diagnosis. Not surprisingly there is considerable overlap between the strategies. One difference between the approaches is the discussion of etiology. The Shen model, for example, takes a "noncommittal" approach (stating "We may never know what these seizures are…"). A fifth approach to the discussion of the etiology communicates the understanding that PNES have two main causes, developmental emotional privation and acute or remote trauma (Kalogjera-Sackellares, 1996).

Unfortunately, there are no comparative studies to guide practitioners in the route they should follow in those areas in which the strategies diverge. Only one of these strategies (consisting of a crib sheet for neurologists and a booklet for patients) has been subjected to a prospective study confirming that patients found the approach acceptable and that the strategy was effective at communicating the possibility of a "psychological" etiology of PNES (Hall-Patch et al., 2010). One in six patients who received the diagnosis in this way reported being PNES free 6 months later (Mayor et al., 2012b).

What the condition is called is a key feature of several of the communication approaches summarized in Table 1. The most appropriate name for PNES has sparked particular debate. It is clear that some possible labels (such as "hysterical seizures" and "pseudoseizures") can offend patients (Stone et al., 2003). It is debatable whether the terms "attack" (differentiating PNES from epileptic "seizures" but potentially associating them with a traumatic attack sustained by patients) or "seizure" (communicating that the doctor is taking the problem seriously but associated with a potential risk of confusion with epileptic seizures) is most suitable (LaFrance, 2010). One small linguistic study of 13 patients with PNES suggested that they treated both terms as problematic (Plug et al., 2009).

More important than the preferred label (or whether a label is used at all) is likely to be how empathetically the diagnosis is presented, and whether the doctor communicates that s/he has understood the patient's account of the problem. It is likely to be helpful if the person communicating the diagnosis has a thorough understanding of epilepsy *and* PNES and is able to communicate the diagnosis with conviction.

Given that it is one of the aims of the discussion to modify patients' thoughts about their condition, and considering that patients may share unhelpful illness perceptions with family members or relevant others, encouraging patients to bring someone along when the diagnosis is discussed with them is preferred. Ideally, these significant others can help take in what the doctor has to say and help to reinforce the information after the encounter. It is also essential that the diagnosis is communicated clearly to other doctors involved in the patient's care (i.e., copy the

Table 1. Strategies used for the communication of the diagnosis of psychogenic nonepileptic seizures

Shen et al. (1990)	Mellers (2005)	Duncan (2010)	Hall-Patch et al. (2010)
Good news—the seizures are not caused by epilepsy, explain vEEG findings.	Cover reasons for concluding they do not have epilepsy.	Explain how vEEG works and how it has helped with the diagnosis.	Genuine symptoms. Real events—can be frightening or disabling.
Bad news—we do not know the precise cause of the seizures but: They are nonepileptic, antiepileptic drugs do not work.	Relay what they do have (explain "switching off"; describe dissociation).	Seizures are emotional/ psychological, due to past/ present issues, not a medical condition.	Label. Give a name for the condition. Give alternative names they may hear.
Antiepileptic drugs may cause serious side effects.	Emphasize they are not suspected of "putting on" the events.	List possible predisposing factors as "specimen causes" not directly linked to the patient.	Reassure that this is a common and recognized condition.
"We may never know what these seizures are but can work together on the problems."	They are not "mad"; the problem is common, and seizures are disabling.	Seizures are not under conscious control but patients can learn to control them with help from a therapist.	Cause and maintaining factors: Not epilepsy, predisposing factors difficult to identify, precipitating
In most cases seizures are eventually related to upsetting emotions of which patients are unaware.	Events are stress related, but stresses may be difficult to identify.	Patients may have anxiety or low mood but are otherwise not mentally ill or "mad."	factors can be related to stress/emotions, perpetuating factors (vicious cycle: worry or stress/events get worse/more
This may be best addressed by psychiatrist, psychologist or counselor.	Triggering "stresses" may not be immediately apparent.	Drug treatment does not work, psychological treatment can work, no other treatment is	worry). Provide a model for the events—e.g., brain becomes
You are not crazy, the seizures occur at a subconscious level.	Relevance of etiologic factors in their case.	available.	overloaded and shuts down.
Counseling may not control seizures immediately, but seizures can improve as treatment progresses.	Maintaining factors. Worry about seizures may make them worse/more frequent.	Describe psychological intervention. Ask whether patients want psychological intervention.	Treatment. Antiepileptic drugs are not effective. Evidence that psychological treatment is effective.
Neurologic follow-up will continue.	Avoidant behavior may make seizures worse.		Talk about referral to a treatment specialist.
A history of sexual abuse is discovered in many cases.	May improve after correct diagnosis.		Expectations. Can resolve. Can expect improvement.
The seizures may stop spontaneously. Although they are subconscious, a conscious effort can sometimes stop them.	Caution that AED withdrawal should be gradual.		
More seizures may occur before complete control is achieved.	Describe psychological treatment.		
	Include patients' caregivers when delivering this explanation.		

medical record of the interview/examination to the other treatment providers), so that the considerable risk of diagnostic confusion and re-prescription of AEDs is minimized; one study showed that 4 years after diagnosis of PNES and withdrawal of AEDs, 40% of patients were taking AEDs again (Reuber et al., 2003b).

Although the short-term outcome (at least in terms of self-reported seizure control) of "minimal" therapeutic interventions such as the explanation of the diagnosis (or a brief psychoeducation approach) is relatively well documented now, the encouraging short-term outcomes are not matched by those seen over the longer term (Reuber et al., 2003b; Wilder et al., 2004). Some early relapses after initial seizure cessation have been described even in the short term (Duncan et al., 2011). It is likely that some patients can learn to control their PNES in the long term with minimal interventions, whereas most need more intensive treatment. Although there are no sufficiently sized comparative studies, a short (<1 year) PNES history may be a good prognostic factor (Duncan et al., 2011).

In view of the documented difficulties some patients have with the understanding of their seizures and the suboptimal longer term outcomes, a single conversation may not suffice to change patients' perception of their problem and enable them to engage in potentially helpful interventions such as psychological treatment (Howlett et al., 2007; Thompson et al., 2009; Baxter et al., 2012). A number of more elaborate psychoeducational procedures have been proposed that give patients more time to understand and process the diagnosis of PNES. One such procedure involving multiple contacts with a psychiatric liaison nurse specialist during an admission for diagnostic vEEG monitoring was reportedly associated with a 100% success at getting patients to attend at least one psychotherapy session (Thompson et al., 2005). Other approaches using four sessions of individual psychoeducation provided by a therapist with minimal training in the delivery of psychological treatment have also been described (Baxter et al., 2012; Mayor et al., 2012a).

The explanation of the diagnosis is likely to be more involved in the 10% (or so) of patients who have PNES

Table 2. Management of psychogenic nonepileptic seizure and evidence basis (updated from Reuber & House, 2002)		
Treatment steps	Direct evidence	Indirect evidence
Diagnosis		
Consider early	X	
Investigate (vEEG)	X	
Assessment		
Characterize:	X	
Neurologic comorbidity	X	
Psychiatric comorbidity	X	
Social/family conflict		
Communication of Diagnosis		
Explain:	X	X
What PNES are not		X
What PNES are		
Psychiatric/psychological treatment		
Patient engagement	X	X
Psychotherapy: CBT for PNES	X	X
Family therapy	X	X
Antidepressants	X	X
Case management		X
Rehabilitation		X

PNES, psychogenic nonepileptic seizures; vEEG, video electroencephalography; CBT, cognitive behavioral therapy.

and epileptic seizures (Lesser et al., 1983; Benbadis et al., 2001), or in those patients who developed PNES after a significant medical problem affecting the brain (such as a head injury) (Hudak et al., 2004; LaFrance et al., 2013b). In such cases, health care professionals may need to invest time and effort to educate patients (and caregivers) about the differences between their PNES and other symptoms.

INITIATING FURTHER TREATMENT(S)

When considering psychiatric treatment and psychotherapy, the following steps should be taken (Table 2).

(a) Formal psychiatric assessment should be arranged and performed.

A formal psychiatric assessment is the optimal path to follow and is recommended to occur early in the diagnostic workup. There are several reasons for this: the need to exclude psychiatric disorders that can be confused for PNES, the apparent complexity of presentation/psychiatric history of many patients, and the need to consider psychopharmacologic management of some comorbidities. Most neurologic examinations will not have teased out all the background factors that may be relevant to the etiology and maintenance of PNES. This assessment addresses and examines psychiatric symptomatology, developmental history, character traits, and psychosocial environment, all of which are relevant not only to the constitutional

makeup of the individual, but also are germane to treatment approaches. Neuropsychological testing is sometimes performed while patients are admitted to a seizure monitoring unit, potentially providing important information about cognitive and emotional functioning. Neuropsychological testing, however, does not differentiate PNES from epilepsy and cannot be regarded as essential in this setting, although it may be helpful in patients with PNES who complain of significant cognitive problems. Moreover, a neuropsychological battery and its interpretation does not provide a five-axis assessment or replace a comprehensive psychiatric assessment.

Ideally, a mental health professional asked to assess and manage a patient with PNES should have some previous experience in this area, should be part of the team that has been assessing the patient, should have confidence in the diagnosis of PNES and other somatoform disorders, and, in particular, should not feel (as sometimes happens) that a difficult patient has been dumped in their lap by a neurologic service eager to be rid of the patient. It should be made clear to the patient that they are seeing this professional because their condition has psychological/neuropsychiatric underpinnings. The mental health professional may be a neuropsychiatrist, psychiatrist, or psychologist who is comfortable and familiar with brain-behavior disorders, understands what characterizes PNES versus epilepsy, and who can properly assess relevant issues of developmental history, abuse and trauma, and psychosocial factors. This is important because patients who are not properly assessed and are told there is "nothing wrong psychiatrically" are subsequently dismissed and sometimes "bounce back," resulting in their rapid return to the neurologic facility or, worse, the patient being abandoned by everybody and the whole diagnostic process to "rule out epilepsy" again, having to be restarted.

The psychiatric assessment should address the differential diagnosis, psychiatric comorbidities, psychopharmacologic and psychological treatments, and acute risks. PNES may be confused with panic attacks or may be accompanied by other conversion disorders, such as psychogenic movement disorders (Witgert et al., 2005). Depending on the results of the formal psychiatric assessment, and who has undertaken it, patients may need to be referred to the appropriate services (including neuropsychiatrists, liaison psychiatrists, community mental health teams, crisis intervention teams, or specialists for other psychiatric disorders). Indeed, where the psychiatric/psychological assessment is not initially undertaken by a psychiatrist or other doctor familiar with pharmacologic treatment options, the neurologist or psychologist/psychotherapist have a professional obligation to recognize when pharmacologic management of psychiatric comorbidities may be needed, and when a referral to a psychiatrist is required. Similarly the mental health professional (if not

medically trained) may also need to be able to consult with suitable medical experts if there are persisting doubts about the neurologic/medical contribution or otherwise of patients' reported symptoms.

Psychiatric comorbidities are the rule, and not the exception, in patients with PNES. Only 5% of patients with PNES do not have a comorbid psychiatric disorder or stressor (Moore & Baker, 1997). A history of trauma or abuse is found in up to 80% of patients with PNES (Bowman & Markand, 1996), and a patient may often divulge this history in an examination where current and past stressors are assessed in a systematic and empathetic manner. This means that it is crucial that this assessment is undertaken by an individual with the skills required to handle such disclosures and in an appropriate setting. The "whole person" biopsychosocial/spiritual model provides an assessment approach that examines the patient in the context of his or her humanity (LaFrance & Devinsky, 2004; McGee & Torosian, 2006; Reuber, 2009), and gives a framework upon which a formulation is generated to inform treatment. This recommendation for psychiatric assessment is made acknowledging the unfortunate reality that psychiatric staff are not part of many teams undertaking PNES diagnoses.

(b) Predisposing, precipitating, and perpetuating factors should be listed.

PNES are a symptom, not the underlying "disease" (LaFrance & Barry, 2005). Merely labeling the events as psychogenic is not sufficient for a complete assessment. Along with the five-axis diagnostic approach (Axis I – psychiatric disorders; Axis II – personality disorders/characteristics; Axis III – medical diagnoses; Axis IV – stressors; Axis V – Global Assessment of Functioning), a problem list with predisposing, precipitating, and perpetuating factors, or "the 3 Ps," is a key component to the formulation (LaFrance & Devinsky, 2002). These factors must be established in individual cases as the formulation may be complex and the Ps may at times, or at least initially, be difficult to identify. However, a common scenario found in patients is a prior history of childhood abuse (predisposing), an assault or injury as an adult leading to disability (precipitating), and recurrent marital discord (perpetuating). Another common scenario that is present is being raised in an alcoholic home leading to a people-pleasing and perfectionistic personality style (predisposing), with a recent motor vehicle accident leading to job loss (precipitating), and ongoing family stressors (perpetuating). In other cases some reminder of an earlier abuse history (e.g., a women whose child reaches the same age as that at which her own abuse occurred, or some other "anniversary") may act as a precipitating factor for the current PNES. These factors contribute to the presentation and promulgation of conversion symptoms. Querying not only childhood abuse

(Salmon et al., 2003), which may have been sexual/physical or emotional and may include more "everyday" childhood stressors such as bullying) but also assaults and events that may have occurred in adulthood (Roelofs et al., 2005) reveals a relevant event in the trauma history in many patients (Reuber et al., 2007b). The importance of examining a patient alone and also with family members or significant others cannot be overemphasized. Some patients may not remember details from past events, or may minimize or have compartmentalized historical factors, and may misreport previous medical details. Family members often provide key details of past events during the evaluation. Other times the patient may not divulge key pieces of data until a sense of trust is established, which occurs with rapport. Identifying and addressing not only the seizures but the problem list resulting from the 3 Ps is essential to the improvement in patients with somatoform disorders including PNES.

(c) Psychotherapy should be implemented when indicated.

Although psychotherapy is the recommended and best-validated approach to treating PNES, it may not be pursued by all patients, despite its "indication." Of note, once a diagnosis of PNES is made we not only give a psychiatric diagnosis, in many cases we also take away a neurologic diagnosis (LaFrance, 2002). Patients who do not accept the diagnosis may not engage in treatment with a mental health provider. The degree of acceptance of a diagnosis and the proposed treatment may influence outcomes; however, this has not been studied as a formal outcome or moderator in controlled treatment trials. As noted above, merely telling a patient that their events are psychogenic or dissociative and are not epileptic in origin is not sufficient to maintain cessation of their seizures in the majority of patients (Wilder et al., 2004). The majority of studies show that PNES continue in long-term follow up in at least two thirds of patients (Reuber et al., 2003b).

Based on national surveys of clinicians who treat PNES in the United States, Chile, and the United Kingdom, the current standard medical care (or treatment as usual) for PNES could be described as a neurologist sharing the diagnosis of PNES with the patient, and family if present, while continuing to follow the patient, tapering the AED in lone PNES, and not initiating psychotropic medication but making a referral to a psychiatrist or psychologist for treatment (LaFrance et al., 2008; Mayor et al., 2011). An international survey showed similar results, cross-culturally (LaFrance et al., 2012). Unfortunately, many patients do not engage with a mental health provider, and they "fall through the cracks" between neurology and psychiatry (Howlett et al., 2007). Failing to address underlying pathology may explain the continuation or

transformation of symptoms, suggesting that psychotherapy may be indicated in all patients with PNES.

1. Individual psychotherapy should be considered to address (b) [predisposing, precipitating, and perpetuating factors].

What psychological treatments might be effective in treating PNES and its comorbidities?

Although psychotherapy is viewed as the treatment of choice for PNES (LaFrance et al., 2008; Mayor et al., 2011), there is no clear agreement as to the type of psychotherapy that is likely to achieve the best results in patients with PNES. It may be that different approaches are most suitable for different groups of patients (Reuber et al., 2005a). Although chapters and reviews have indicated the range of treatments that might be applicable to this patient group (Reuber et al., 2005a; LaFrance et al., 2007a) or which have been reported (e.g., (Brooks et al., 2007; Martlew et al., 2009; Goldstein & Mellers, 2012; Reuber & Mayor, 2012), there is an inadequate evidence base of fully powered, multicentered randomized controlled trials (RCTs) on which rational recommendations about treatment preferences may be made (LaFrance & Barry, 2005). What is evident from recent controlled pilot trials is that many patients enroll with persistent seizures after having had prior supportive therapy or standard medical care in the community.

Over the last 15 years, however, a number of predominantly but not exclusively uncontrolled treatment studies of groups or case series have suggested that psychological interventions are likely to reduce seizure frequency and/or improve health service use (e.g., Aboukasm et al., 1998; Rusch et al., 2001; Prigatano et al., 2002; Goldstein et al., 2004; Zaroff et al., 2004; Khattak et al., 2006; Barry et al., 2008; Kuyk et al., 2008; Mayor et al., 2010; Aamir et al., 2011; LaFrance et al., 2013c, 2009). The general approach within studies has been either to expose individuals to interventions on a one-to-one basis or, in a small number of cases, to undertake group-based work, often as an adjunct to individual psychotherapy. Studies have varied in their inclusion and exclusion criteria, most notably in terms of whether or not they have included people with comorbid epilepsy. The reported outcomes have used different definitions of improvement or seizure freedom (in terms of the period of time under consideration) making direct comparison across studies problematic. Nonetheless, summarized data (Goldstein & Mellers, 2012) suggest that high percentages of the samples studied in uncontrolled treatment trials reported at least a 50% reduction in seizures.

Cognitive behavioral therapy

The most substantial body of data relates to the application of cognitive behavioral therapy (CBT), which has been shown to be effective in the treatment of a range of somatoform disorders (Kroenke, 2007; Hopp & LaFrance, 2012) and is being extended in brief self-help format for

patients with "functional neurological symptoms" (Sharpe et al., 2011). There is no single model of CBT for use by patients with PNES, since the therapy itself permits modification for specific groups according to the model of the disorder, despite containing core principles and techniques. Elements of CBT were present in a number of the approaches applied in the case series reported by Rusch et al. (2001) and characterized the approach adopted by Kuyk et al. (2008). However, the two CBT approaches described in most detail in the literature (Goldstein et al., 2010b) are those used by LaFrance et al. (2009, 2013c) and Goldstein et al. (2004, 2010a). To date, the approach developed by LaFrance et al. (2009) has been evaluated in an open-label study and a multicenter pilot RCT (LaFrance et al., 2013c) and that by Goldstein et al. (2004) in an open-label study and pilot RCT (Goldstein et al., 2010a).

The CBT evaluated by Goldstein et al. (2004, 2010a) was based on a fear escape-avoidance model that views PNES as dissociative responses to cues (cognitive/emotional/physiological or environmental) that have been associated with extremely distressing or life-threatening experiences (e.g., abuse or trauma) and which had produced unbearable feelings of fear and distress at an earlier point in the person's life (Goldstein et al., 2010b). Based on an approach first developed and tested in a single case report (Chalder, 1996), Goldstein et al. (2010a,b) have described their model as focusing on cognitive, emotional, physiologic, and behavioral aspects of PNES. Treatment (delivered across 12 sessions) includes seizure-directed techniques, attention refocusing, relaxation, dealing with avoidance behaviors, negative cognitions, and other factors that may be key to the development and maintenance of PNES (e.g., history of abuse or trauma) and the involvement of family members. Homework tasks (including keeping seizure diaries) are assigned and reviewed in session; psychoeducational leaflets supplement the information provided in sessions. Five stages to the treatment have been outlined (Goldstein et al., 2010b); engagement and rationale giving; teaching and the use of seizure control techniques; reducing avoidance exposure techniques; dealing with seizure-related cognitions and emotions; and relapse prevention.

A pilot RCT (Goldstein et al., 2010a) compared outcomes in 33 patients randomized to CBT versus a group receiving psychiatric outpatient care (which in this case was treatment as usual – TAU). At the end of treatment, the CBT group was experiencing fewer seizures on a monthly basis than the TAU group. When considering the final 3 months of a 6-month follow-up period, the CBT group was approximately three times more likely than the TAU group to have been seizure free in that period, although the between-group differences in seizure frequency was not quite significant at that point (p = 0.082) in part due to further improvement by the TAU group. Both groups showed some improvement on measures of

health service use and on a measure psychosocial functioning, the Work and Social Adjustment Scale. The results were promising in relation to seizure frequency. The study was nonetheless modest in size, requiring replication with larger samples across multiple centers.

LaFrance et al. (2009) reported the development of the CBT-informed model based on an approach initially derived to enhance self-control of epileptic seizures (Reiter et al., 1987), modified with a Beckian approach. The intervention is predicated on the assumption that life experiences and trauma in patients with PNES result in maladaptive core beliefs (negative schemas) and patients demonstrate cognitive distortions and somatic symptoms. The 12-session therapy is designed to promote behavioral change and self-control, self-efficacy, and has been tailored specifically for patients with PNES, in order to address directly both the seizures and the comorbidities that commonly occur in this disorder. As in the approach developed by Goldstein et al. (2004, 2010a), LaFrance et al. (2009) treatment has the advantage of being manualized, facilitating its evaluation in multicenter studies. The 12 treatment sessions involve (LaFrance et al., 2009; Goldstein et al., 2010b): an introduction contextualizing the person's environment; a test on identifying moods, situations, and thoughts; training in healthy communication, support seeking, and goal setting; understanding central nervous system medications and seizures; identifying an aura, conducting a functional behavioral analysis; learning relaxation techniques; examining external stressors and internal triggers; promoting health and wellness, and preparing for life after completing the intervention. The therapy addresses connections between mood, cognitions, and the environment, as well as patients' automatic thoughts, catastrophic thinking, maladaptive schemas, and somatic misinterpretations. An open-label evaluation found that 16 of 21 participants reported a 50% reduction in seizure frequency and 11 of 17 people completing the treatment were seizure free in the final week of treatment, although no follow-up data were available. Improvements were also found on measures of depression, anxiety, somatic symptoms, quality of life, and psychosocial (including family) functioning. The open-label study was followed by a pilot multicenter RCT (LaFrance et al., 2013c). Thirty-five patients in total with vEEG confirmed lone PNES were randomized at three sites to one of four treatment arms: Medication (sertraline) only, Cognitive Behavior Therapy (CBT) only, CBT and Medication combined, or Standard Medical Care (SMC). The CBT arm showed significant seizure reduction, and improvement in functioning and scores on symptoms scales. The combined treatment arm showed improvements, but less than the CBT only arm, and Medication showed trends for improvement. SMC showed no seizure reduction or improvement in any secondary outcomes, underscoring that supportive therapy does not work for PNES.

Psychodynamic therapy

Two psychodynamic therapeutic approaches have also been described in some detail. Kalogjera-Sackellares (2004) has provided an overview of the key psychodynamic features important in the diagnosis and treatment of PNES. Her model notes that trauma is a central feature of PNES. The trauma can be a single catastrophic event or the result of chronic recurrent traumata. Therefore, the key to recognizing, understanding, and treating patients with PNES is recognition of the key role of trauma and the response to trauma in the psychopathology of these patients. The model draws upon three major areas of psychodynamic theory: (1) psychoanalytic theory, (2) object-relations theory, and (3) self-psychology. Fundamental concepts from each of these areas are used to explain clinical symptomatology and to formulate therapeutic approaches. The working model of PNES centers around three cardinal features: (1) the importance of trauma, (2) the chronicity of symptoms, and (3) the wide range of symptoms experienced by individual patients. Cases treated with this model are described, but controlled data have not been reported using this model.

An augmented from of brief psychodynamic interpersonal therapy (PIT) for PNES has also been described (Howlett & Reuber, 2009). The effectiveness of this approach has not been proven in an RCT, but a service evaluation (describing treatment in >50 patients) have suggested that the treatment has clinically meaningful effects on seizure frequency and severity, psychological distress, quality of life, and functioning in the short term (Reuber et al., 2007a); that the effect on seizures is maintained in the long term (Mayor et al., 2010), and that the treatment is cost-effective (Reuber et al., 2007a; Mayor et al., 2010). The therapeutic approach is an adaptation of the model of brief PIT developed by Hobson (1985). The original model was found to have equivalent effects to cognitive-behavioral therapy for the treatment of depression (Shapiro & Firth, 1987), and an adapted model for functional somatic disorders, on which this therapy is based, was shown to be helpful and cost-effective in the treatment of functional bowel disorders (Guthrie et al., 1991; Creed et al., 2003).

The therapy uses an accessible, empathic approach, inviting correction and collaboration with the patient. Key features include (1) the assumption that the patient's problems arise from or are exacerbated by disturbances of significant personal relationships, with dysfunctional interpersonal patterns usually originating earlier in their lives, and the explicit linking of this to the patient's symptoms; and (2) a tentative, encouraging, supportive approach from the therapist, using the terms "I" and "we" to emphasize the collaborative nature of the work. Understanding hypotheses are used to develop awareness of the patient's current feelings (e.g., "I guess you might be feeling quite angry when you remember that"). "Linking

hypotheses" are introduced to make connections between current feelings and other feelings both inside and outside therapy (e.g., "You say you're feeling small and frightened now – I wonder if that's a bit like how you felt as a child when your parents used to fight?"). "Explanatory hypotheses" look for possible underlying reasons for a patient's behavior, particularly a repeated pattern of behavior (e.g., "When you try so hard not to get upset here with me, maybe it's because your dad used to beat you more if you cried, so you came to feel that showing your feelings was bad and dangerous. Maybe it even feels as if it might make me angry"). The key mechanisms for therapeutic progress are seen as the identification and change of unhelpful patterns of interpersonal relationships, and the more effective processing of emotions, particularly in relation to painful memories or areas of patients' lives that may not have been dealt with previously.

Because of the florid, easily triggered symptomatology and level of psychological traumatization of many patients with PNES, the augmented brief PIT for PNES combines this approach with concepts and techniques from a model of somatic trauma therapy, which includes techniques to control autonomic arousal, to track somatic symptoms and link them with emotional triggers, and to process traumatic memories without retraumatizing potentially fragile patients (Rothschild, 2000).

In practical terms this approach involves an initial extended session in which the patient is engaged and in which a diagnostic formulation is developed. Up to 19 subsequent sessions then use the approach described above to change the patients' illness perceptions, achieve symptom control, improve emotional processing, increase independence, encourage self-care, and process trauma. The support of family, caregivers, and other health care professionals is enlisted if possible (Howlett & Reuber, 2009).

Other interventions

A number of other interventions have been studied either only in single case studies, small group studies, or in studies where the main patient group had other (especially motor) conversion disorders. Therefore, for example, although hypnosis has been tested as a diagnostic tool for PNES, with varying levels of sensitivity and specificity when PNES patients are compared to people with epilepsy (Kuyk et al., 1995, 1999; Barry et al., 2000; Khan et al., 2009), and studies have also shown that patients with PNES obtain higher scores than patients with epilepsy on measures of hypnotizability (Kuyk et al., 1999; Barry et al., 2000; Khan et al., 2009), thereby raising expectations of the potential utility of hypnosis as a therapeutic tool for PNES, little explicit use has been made of hypnosis in the treatment of PNES, and there is no robust evidence to recommend its use as a primary intervention for PNES, even when administered by an experienced hypno-

therapist. However, a number of single case reports of its use as an adjunctive therapy can be found (e.g., Stonnington et al., 2006). Accounts of its use in motor conversion disorder, where hypnosis has been used directly and indirectly to influence the relevant symptoms or explore events likely to have triggered the symptoms (Moene & Hoogduin, 1999) have indicated that its use may not always be without problems, and other psychopathology may give rise to unexpected responses or the need to modify the hypnotic induction technique (Moene & Hoogduin, 1999). In RCTs of a hypnosis-based treatment versus waiting list for motor conversion patients (of whom only a minority had seizures as their main symptom), no data were presented specifically in terms of outcome for PNES occurrence (Moene et al., 2002, 2003).

Although eye movement desensitization and reprocessing (EMDR) has a strong evidence base for the treatment of posttraumatic stress disorder (e.g., Hogberg et al., 2008), there is no evidence for its use as a primary intervention in patients with PNES beyond the case series level (Chemali & Meadows, 2004; Kelley & Benbadis, 2007), or incorporated within a more complex intervention (Howlett & Reuber, 2009). Similarly although EEG biofeedback has been evaluated as a treatment for epilepsy, the use of sensorimotor theta biofeedback has been evaluated only at the level of single cases for PNES (Swingle, 1998), and then as an adjunct to psychotherapy rather than as a treatment in its own right. In one small study where there was (rather poorly reported) random allocation of patients to treatment groups (behavior therapy vs. pharmacotherapy and outpatient psychiatric review), behavior therapy (the use of positive reinforcement for seizure-free behavior and punishment—to reduce inappropriate behavior—as well as avoiding the use of negative reinforcement) was reported to lead to a reduction in PNES frequency, anxiety, and depression (Aamir et al., 2011). In an earlier study (Ataoglu et al., 1998, 2003), a paradoxical intention approach (where, for example, patients were instructed to imagine situations where they were likely to have their seizures or to provoke seizures) suggested a greater improvement in terms of seizure reduction and improvement in anxiety scores than in patients treated with diazepam. However, this therapeutic approach has not generated sufficient interest to provoke replication in more robust studies.

Group therapies

Group therapies have focused on psychoeducational approaches to intervention, using a multisession group approach (Myers & Zaroff, 2004; Zaroff et al., 2004) with mixed results on seizure occurrence but improvement in psychological well-being (Zaroff et al., 2004). Group therapy with a psychodynamic focus, which conceptualized the seizures as an expression of unconscious/

hidden emotions, has been undertaken (Barry et al., 2008), but with only small numbers of patients. Pilot data from seven female patients completing at least 75% of 32 weekly 90-min–long sessions suggest, based on measures of depression, global symptom severity, and PNES frequency, that there may be some benefit in using this approach as an adjunct to individual psychotherapy. However, the numerous methodologic limitations of this pilot study would necessitate further careful study of this approach.

2. Family therapy may be indicated if family system dysfunction is present.

Families of patients with PNES have higher levels of family dysfunction than patients with epilepsy (Krawetz et al., 2001). Patients with PNES see their families as having less commitment and support for each other compared to patients with epilepsy (Moore et al., 1994). Family dysfunction is a contributor to symptoms of depression and to poorer quality of life in PNES (LaFrance et al., 2011). Given these findings, aspects of family dysfunction may be a treatment target in PNES. A well-studied model used for family therapy is the McMaster's approach (Ryan et al., 2005). The problem-centered, systems-based model addresses affective responsiveness, affective involvement, problem solving, roles, behavior control, communication, and transactional patterns in families (Miller et al., 1985). The systems approach addresses the isolating and restricting tendencies of the patient with PNES in the context of his or her social environment, which may influence integration into the community (LaFrance & Devinsky, 2004). The model has been used successfully in cases of PNES (Archambault & Ryan, 2010). Controlled trials of family therapy for patients with PNES are needed to assess efficacy.

(d) The pharmacologic treatment of patients should begin with early tapering and discontinuation of AEDs, which are an ineffective treatment for people with lone PNES, unless a specific AED has a documented beneficial psychopharmacologic effect in an individual (e.g., use for bipolar disorder or as a treatment for migraine).

It has been shown that the withdrawal of inappropriately prescribed AEDs is safe for people without comorbid epilepsy and that immediate as opposed to delayed AED withdrawal may have greater beneficial effects on a range of clinical outcomes (Oto et al., 2005, 2010) including seizures and health service use. The importance of early AED withdrawal lies partly in communicating to the patient that they do not have epilepsy and thus that such medication is unwarranted. In view of the potential teratogenic effects of some AEDs, this assumes additional importance for women of child-bearing age, who make up the majority of people with PNES.

(e) In people with mixed epileptic seizures (ES) and PNES, reduce high doses of AEDs or polytherapy if possible.

More rigorous studies show that approximately 10% of patients with PNES have epilepsy (Benbadis et al., 2001). In cases of mixed ES/PNES, identifying the different ictal semiologies of the ES and PNES is essential for directing treatment to the different etiologies. For the epilepsy, reduction of the AED dose to the minimum required to achieve optimal freedom from epileptic seizures was shown to be effective (Blumer & Adamolekun, 2006), given that AEDs can exacerbate PNES (Niedermeyer et al., 1970). AED toxicity was found to result in an increased seizure frequency in patients with PNES (Krumholz & Niedermeyer, 1983). Treating the ES with AEDs and the PNES with psychotherapy allows for targeted interventions for the different etiologies. Good communication between the neurologist/epileptologist and the health professional providing psychological treatment is needed to keep the patients with mixed ES/PNES out of the emergency department with recurrences of PNES.

(f) Use psychopharmacologic agents to treat comorbid mood, anxiety, or psychotic disorders, and possibly to treat somatoform symptoms directly.

Psychopharmacologic interventions for PNES have been used to treat the somatoform disorder directly and to treat the common comorbidities (LaFrance & Blumer, 2010). Medication treatment approaches historically have been prophylactic or symptomatic. As of yet, no acute pharmacologic treatment for PNES has been developed, except for stopping convulsions with excessive sedation and paralytic agents, used in psychogenic nonepileptic status (Walker et al., 1996). While paralysis, intubation, and coma-pharmacoinduction are indicated in epilepsy status, this is not the appropriate treatment algorithm for the patient with PNES-status, who is not at risk of brain damage from the seizure. Consulting treatment providers familiar with PNES during the acute presentation may mitigate iatrogenesis.

Open-label trials of antidepressants in patients with conversion disorders have shown some response (O'Malley et al., 1999; Varia et al., 2000; Voon & Lang, 2005). Phase III controlled studies of the benefit of psychotropics in patients with PNES, however, have not been conducted, and apart from anecdotal reports, their effect is unknown (LaFrance & Barry, 2005). The use of pharmacologic treatments for PNES with intravenous barbiturates, tricyclic antidepressants, selective serotonin reuptake inhibitors (SSRIs), mixed mechanism antidepressants, dopamine receptor antagonists, beta-blockers, analgesics, or benzodiazepines has largely been reported anecdotally in case reports, journal review articles, or book chapters, with only three prospective open-label trials (Ataoglu et al., 1998; LaFrance et al., 2007b; LaFrance & Blumer,

2010; Pintor et al., 2010). Only one double-blind placebo-controlled pilot RCT for PNES has been published (LaFrance et al., 2010). Thirty-eight patients enrolled, and 26 (68%) completed the trial. Thirty-three subjects with non-zero baseline seizure rates were included in an intention-to-treat analysis of the primary outcome. Patients assigned to the sertraline arm experienced a 45% reduction in seizure rates from baseline to final visit (p = 0.03) versus an 8% increase in placebo (p = 0.78). The pilot study was not powered for efficacy but showed feasibility for a pharmacologic RCT. Data from this RCT and other open-label trials indicated that medications may help to reduce symptoms, but would likely require adjunctive psychotherapy to eliminate seizures.

Treatment Maintenance

Good communication between treatment providers and a coordinated care approach should prevent further unnecessary interventions, investigations, or treatments.

The longer-term studies currently available suggest that many patients with PNES will continue to experience seizures despite neurologic and psychotherapeutic care (Reuber et al., 2003b). Even patients who become free of seizures may remain disabled (Reuber et al., 2005b). Given the association of PNES with serious and pervasive conditions such as borderline personality disorder, PTSD and somatization disorder (at least in important subgroups of patients) (Reuber et al., 2003a; Lacey et al., 2007), it is not surprising that many patients remain symptomatic and disabled. Some patients with chronic seizure disorders (and their families) may have become dependent on health-related benefits associated with PNES. While experts think that only a small minority of individuals (<5%) intentionally produce their symptoms, some chronic NES may be factitious or malingered (e.g., not psychogenic, rather feigning seizures to get out of military service or incarceration, or for remuneration or medication seeking). Unfortunately, there are no reliable medical tests for malingering other than the careful observation of patient's behavior or the patient's admission. It is important for doctors who look after patients with PNES in the longer term to appreciate the limitations of the interventions at their disposal and to reappraise their own motivation for providing continuing care to these patients if they want to protect their patients from going through endless cycles of investigations, treatment proposals, and disappointments (Page & Wessely, 2003).

This is not to say that patients with refractory PNES should not be followed. Long-term follow-up with a doctor who has a good understanding of seizure disorders and the psychological needs of patients with PNES serves a number of important functions: (1) It gives the doctor the opportunity to review the diagnosis—one important reason for the patient's failure to respond to psychological treatment would be that they have another condition, including epilepsy or another medical disorder (Parra et al., 1999). (2) It enables the doctor to make sure that the diagnosis of PNES does not change inappropriately—for instance to one of epilepsy—and that patients are not (re-)started on inappropriate AEDs. (3) It allows the doctor to limit the investigation of other symptoms for which a medical cause is unlikely. (4) It enables doctors to reduce the risk of iatrogenic injury (for instance by communicating the diagnosis clearly to anesthetists, dentists, or obstetricians who are likely to encounter a patient with PNES) (Reuber et al., 2000). (5) It provides an opportunity to interact with the patient's caregivers to limit overprotection or inappropriate dependence and to limit the harm done by PNES or patients to others (for instance dependent children who end up caring for their mother or father with PNES). (6) It makes it possible for doctors to refer patients for treatments as their understanding of the disorder or their personal circumstances change—patients who were unable to engage in psychological treatment immediately after the diagnosis may well be able to accept a referral for treatment after some time (Howlett et al., 2007). (6) Doctors may be able to offer or refer patients for treatment approaches that are not intended to "cure," but that aim to reduce handicap for instance by negotiating small changes in behavior, encouraging self-monitoring of behavior, and scheduling graded social and physical activity. This sort of approach may not need to involve a psychotherapist. Occupational therapists, physiotherapists or experts in rehabilitation may be able to oversee this approach. Whilst none of these techniques have been evaluated in patients with PNES, they have been shown to be effective in other conditions traditionally thought of as not amenable to psychological intervention such as the negative symptoms of schizophrenia (Hogg, 1996). (7) Doctors may also consider more intensive treatment programs (for instance for borderline personality disorder) (Linehan, 1993; Palmer et al., 2003; Kellett et al., 2011) or inpatient treatment, especially if the disruption of the patient's home and care arrangements is desirable from a therapeutic point of view (Schöndienst, 2001; Kuyk et al., 2008).

Conclusion

There is a range of key skills and expertise required to offer comprehensive treatment to patients with PNES (i. e., neurology, neurophysiology, neuropsychology, psychiatry, neuropsychiatry, psychotherapy, social work/rehabilitation), which is not available in all practice locations. Identifying key team members with appropriate training who can provide care for patients with PNES is a

necessary process in developing a management program for PNES. Good communication between those who make the diagnosis and who are involved with management is essential.

Proper diagnosis is the first step in treatment. Providing a definitive diagnosis of PNES and assessing the comorbidities are essential in understanding the patient. The presentation of the diagnosis is an important part of introducing the mental health component to the treatment. Communicating to the patient that the seizures have a psychological etiology and are not epilepsy may stop PNES in the short-term, but does little to improve associated psychological morbidity, distress, or health-related quality of life. Without dedicated further treatment, PNES are likely to re-start in the majority of patients. Treatment specifically addressing PNES is required in most patients with PNES. Underlying psychopathology, prior abuse history, and recurrent stressors may act as predisposing, precipitating, and perpetuating factors for the seizures. These factors can be addressed effectively in psychotherapy with a provider who is comfortable and familiar with PNES and somatoform disorders, and who understands how these disorders differ from their neurologic counterparts. Increasing evidence shows that cognitive behavioral, psychodynamic, and interpersonal modalities may be effective in managing PNES, although further treatment studies are required to establish the optimal treatment approach. Involving the family of the patient with PNES may aid in social reintegration in the community. Pharmacotherapy includes reducing unnecessary AEDs in lone PNES and titrating to limit potential side effects in mixed ES/PNES. Psychotropic medications may help reduce comorbid symptoms, including anxiety and depression, which commonly occur in PNES. Controlled pilot trials in the last decade have demonstrated benefit in treating PNES, and multi-centered, fully powered RCTs are needed for establishing their efficacy. Continued collaborative management between neurology, psychiatry, and psychology is essential to reduce morbidity and improve the lives of patients with PNES.

DISCLOSURE

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