Epilepsy & Behavior 29 (2013) 155–160

Contents lists available at SciVerse ScienceDirect

Epilepsy & Behavior

journal homepage: www.elsevier.com/locate/yebeh

Psychiatric disorders in patients with psychogenic nonepileptic seizures and drug-resistant epilepsy: A study of an Argentine population

Laura Scévola [a,b,*], Julia Teitelbaum [b], Silvia Oddo [a], Estela Centurión [a], César Fabián Loidl [a], Silvia Kochen [a], Luciana D´Alessio [a]

[a] Epilepsy Center Ramos Mejía Hospital, Cell Biology and Neuroscience Institute (IBCN), Buenos Aires University (UBA)-CONICET, Buenos Aires, Argentina
[b] Psychiatry Division, Ramos Mejía Hospital, Buenos Aires, Argentina

ARTICLE INFO

Article history:
Received 6 May 2013
Revised 11 July 2013
Accepted 13 July 2013
Available online xxxx

Keywords:
Conversion disorder
Hispanic
Dissociative disorder
Epilepsy
Personality disorders
Posttraumatic stress disorder
Psychogenic nonepileptic seizures
Trauma
Video-electroencephalography

ABSTRACT

Epidemiological data show that up to 20–30% of patients with psychogenic nonepileptic seizures (PNESs), resembling drug-resistant epilepsy (DRE), are referred to tertiary epilepsy centers. Furthermore, both disorders present high psychiatric comorbidity, and video-EEG is the gold standard to make differential diagnoses. In this study, we described and compared the clinical presentation and the frequency of psychiatric disorders codified in DSM IV in two groups of patients, one with PNESs and the other with DRE, admitted in a tertiary care epilepsy center of Buenos Aires, Argentina.

We included 35 patients with PNESs and 49 with DRE; all were admitted in the video-EEG unit in order to confirm an epilepsy diagnosis and determine surgical treatment possibilities. All patients underwent a neurological and psychiatric assessment, according to standardized protocol (SCID I and II; DSM IV criteria). Student's *t* test was performed to compare continuous variables and Chi square test to compare qualitative variables.

In this study, 33 (67%) patients with DRE and 35 (100%) patients with PNESs met criteria for at least one disorder codified in Axis I of DSM IV ($p = 0.003$). Differences in the frequency of psychiatric disorder presentation were found between groups. Anxiety disorders (16.32% vs 40%; $p = 0.015$), trauma history (24.5% vs 48.57%; $p = 0.02$), posttraumatic stress disorder (4.08% vs 22.85%; $p = 0.009$), and personality cluster B disorders (18.37% vs 42.86%; $p = 0.02$) were more frequent in the group with PNESs. Psychotic disorders were more frequent in the group with DRE (20.4% vs 2.85%; $p = 0.019$). Depression was equally prevalent in both groups.

Standardized psychiatric assessment provides information that could be used by the mental health professional who receives the referral in order to improve quality of care and smooth transitions to proper PNES treatment, which should include a multidisciplinary approach including neurology and psychiatry.

1. Introduction

Psychogenic nonepileptic seizures (PNESs), are diagnosed in the presence of disruptive changes in behavior, thought, or emotion but are not related to ictal discharges in the electroencephalogram (EEG) [1,2].

Neurologists and psychiatrists frequently misdiagnose PNESs. Data show that up to 20–30% of patients suffering from PNESs, resembling drug-resistant epilepsy (DRE), are referred to tertiary epilepsy centers [3–5].

Following the implementation of video-EEG, recognition of PNESs has increased dramatically. During video-EEG, a patient's behavior is recorded, while electrical brain activity is detected through EEG. While its most frequent indication is presurgery assessment of patients with DRE, it is also the gold standard for the differential diagnosis between epilepsy and PNESs [1–3]. Notwithstanding, diagnostic delay remains an important issue considering the unnecessary exposure to antiepileptic drugs (AEDs) [6,7] and the time spent without adequate psychological treatment [4,8,9].

Both DRE and PNESs present high comorbidity with psychiatric disorders. Patients with DRE present high prevalence of depression, psychoses, and personality disorders [4,10–13], and most PNES cases are codified as somatoform disorders (conversion disorder in particular) and/or dissociative disorders in the DSM IV [14] and the ICD 10 [15]. Current data support its comorbidity with other psychiatric disorders, including depression, anxiety, PTSD, and personality disorders [10,16,17]. Nevertheless, other psychiatric factors such as trauma and posttraumatic stress disorder (PTSD) are often involved in the PNES etiopathogenesis [1,2,16].

To the best of our knowledge, only a few studies in Latin America have determined psychiatric characteristics of patients with either PNESs or DRE using contemporary nosography [4,18,19]. Psychogenic

Abbreviations: DRE, Drug-resistant epilepsy; PNESs, Psychogenic nonepileptic seizures.

* Corresponding author at: Psychiatry Division, Ramos Mejía Hospital, Buenos Aires, Argentina.
E-mail address: laurascevola@gmail.com (L. Scévola).

1525-5050/$ – see front matter © 2013 Elsevier Inc. All rights reserved.
http://dx.doi.org/10.1016/j.yebeh.2013.07.012

nonepileptic seizures in other cultures and ethnicities need to be studied to determine whether findings that have been elsewhere reported are generalizable. Furthermore, the diagnosis of psychiatric and personality disorders could be influenced by cultural variables. The findings of this study would allow us to determine similarities and differences with respect to the distribution of psychiatric disorders reported in other cultures [20–22].

In a previous report published by our group [4], we compared the prevalence of psychiatric disorders in patients with pure PNESs and in patients with both PNESs + epilepsy, using SCID I/II and DSM IV [14] criteria. In this previous study, patients with pure PNESs showed a significantly greater frequency of anxiety disorders, dissociative disorders, and PTSD compared with the group with PNESs + epilepsy [4].

The aim of the present study was to describe and compare the frequency of psychiatric disorders diagnosed with Axis I and Axis II of DSM IV in patients with pure PNESs and pure DRE, admitted in the video-EEG unit at Epilepsy Center, Ramos Mejía Hospital (ECRMH), Buenos Aires, Argentina [4,23].

2. Methods

2.1. Patient selection

The ECRMH is the major public referral center of epilepsy in Buenos Aires City, Argentina. As a tertiary referral epilepsy center, it serves a population drawn from other parts of the country, with high rates (70–80%) of DRE [23].

In this study, we included patients aged between 18 and 65 years, admitted in the video-EEG unit of ECRMH in order to confirm an epilepsy diagnosis and determine surgical treatment possibilities (the age range was determined in relation to the population admitted in the ECRMH for the epilepsy surgical program). All patients who underwent neurological assessment according to standardized clinical history (epidemiological surveillance program, VIGIA) were evaluated. Neurological evaluation, interictal EEG, MRI with a temporal lobe epilepsy protocol, and neuropsychological and psychiatric assessments were performed in all patients according to the standardized protocol performed at the video-EEG unit of ECRMH [4,23].

2.2. Video-EEG evaluation

All the patients included in this study underwent video-EEG evaluation in order to confirm the DRE/PNES diagnosis and to determine the possibility of epilepsy surgery.

For long-term EEG monitoring, a Stellate-Bioscience EEG machine at a 200-Hz sample rate was used. All ictal recordings were obtained using the international 10–20 system with the addition of temporal electrodes of the 10–10 system. Referential montages as well as longitudinal–bipolar and transverse bipolar montages were used for the analysis.

2.3. Inclusion and exclusion criteria

Two groups of patients were included: patients with PNESs diagnosed by video-EEG and patients with DRE diagnosed by video-EEG. Both groups underwent the standardized psychiatric protocol.

Diagnosis of PNES (psychogenic nonepileptic seizures) was made by epilepsy specialists based on clinical history and video-EEG monitoring, complemented by psychiatric evaluation to certify their psychogenic origin.

Psychogenic nonepileptic seizure diagnostic criteria were defined as follows: 1 — atypical paroxysmal behavioral episodes recorded by video-EEG monitoring, without electroencephalographic ictal activity (at least one attack recorded) and 2 — no existing clinical, electroencephalographic, or neuroimaging evidence suggestive of epilepsy; neither neurological nor medical disorder that explains the atypical paroxysmal behavior (exclusion criteria). Epileptic seizures were diagnosed if at least one characteristic clinical event was recorded with simultaneous ictal EEG abnormalities. The subtype of epileptic syndrome was diagnosed according to ILAE nomenclature. Finally, DRE was defined as failure to achieve sustained seizure control (no type of seizures for a period of 12 months or prolongation of three times the preintervention interseizure interval, whichever is longer), with at least two trials of well-tolerated, appropriately chosen, and adequately scheduled AEDs (irrespective of being administered as monotherapy or in combination) to achieve sustained seizure control [5].

In this study, we included a group of 35 patients with only PNES episodes admitted from March 2000 to December 2010 (a subgroup of these patients with PNESs was previously reported by our group) [4]. A second group of 49 patients with DRE confirmed by video-EEG was included. This second group was consecutively admitted in the Epilepsy Center from March 2008 to December 2010.

Exclusion criteria were the following: patients who did not complete all diagnostic tests and patients with both types of seizures (PNESs + epilepsy), paroxysmal events of other medical etiologies (e.g., transient ischemic attacks, vasovagal syncope, sleep disorders, and nonepileptic myoclonus), history of mental retardation (attending a special school), and/or IQ < 70 according to the Wechsler Adult Intelligence Scale (WAIS) [24]. Wechsler Adult Intelligence Scale was performed in all patients by a neuropsychologist.

Ten (11.9%) patients were excluded because of mental retardation, 16 (19%) had both types of seizures (PNESs + epilepsy), and 5 (5.95%) did not complete all diagnostic tests.

2.4. Psychiatric assessment

Psychiatric assessment was performed by trained psychiatrists who were blind to the seizure diagnosis during video-EEG monitoring (usually five days). Psychiatric history was obtained from each patient, complemented by information from relatives.

All patients underwent the Structured Clinical Interview for DSM IV Axis I disorders (SCID I), a semistructured interview for making the major DSM IV Axis I diagnoses and the SCID II, which is a semistructured interview for making DSM IV Axis II personality disorder diagnoses (Spanish Clinical Version of SCID I [25] and SCID II [26]). Diagnosis of dissociative disorder was based on DSM IV criteria. All patients were assessed according to the Global Assessment of Functioning (GAF). The GAF is a 100-point tool rating overall psychological, social, and occupational functioning included in the DSM IV in the section on multiaxial assessments (Axis V of DSM IV) [14]. The interviews were carried out in approximately 2 to 3 h.

Trauma history was defined as criteria A of PTSD (DSM IV), which states that the person has experienced, witnessed, or been confronted with an event or events that involve actual or threatened death or serious injury, a threat to the physical integrity of oneself or others, and a response that involved intense fear, helplessness, or horror. Trauma characteristics were classified as follows: sexual, violence (traumatic accident, theft, physical abuse), and illness or loss of a significant other.

In patients with PNESs, all types of PNESs recorded in the video-EEG were considered a “core syndrome” for making DSM IV diagnoses of somatoform (conversion) and/or dissociative disorder. Other psychiatric disorders were considered as comorbid disorders (e.g., affective disorders, anxiety disorders, PTSD, and psychotic disorders). Personality disorders were analyzed individually but presented in clusters because of the overlap between diagnoses within each cluster [20] as follows. Cluster A: paranoid, schizoid, and schizotypal; cluster B: antisocial, borderline, histrionic, and narcissistic; and cluster C: avoidant, dependent, obsessive–compulsive schizoid, paranoid, and schizotypal.

The following variables were analyzed and compared between both groups: age, gender, education, marital status, psychotropic medication,

current or past psychiatric disorders codified in Axis I of DSM IV, trauma history, presence of personality disorder, and GAF score.

Once the diagnostic protocol was completed, all patients with PNESs with current psychiatric disorder were referred for psychiatric treatment and psychotherapy. Treatment with antiepileptic drugs (AEDs) was continued in the group with DRE.

2.5. Ethics committee

Approval of the Ethics Committee of Ramos Mejía Hospital was obtained to conduct of the study in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki, and all the subjects submitted informed consent.

2.6. Data analysis

The rate of occurrence of psychiatric disorders (categorical variables) was compared between the groups. Proportions were evaluated using Chi square test (χ^2). Comparisons among the groups for continuous variables were made using Student's *t* test (t).

Statistical significance was fixed at $p \leq 0.05$. For reducing the alpha level and the Type I error, a *p* value ≤ 0.01 was considered highly significant. Statistical analyses were performed using SPSS for Windows.

3. Results

A total of 84 patients were included in this study, 56 females and 28 males, aged between 18 and 65 years old. Thirty-five patients were included in the group with PNESs; mean duration of PNESs until video-EEG diagnosis was 11.18 years (±12.64), with a range of 1 to 47 years. Gender, education, age, marital status, education level, and origin (Buenos Aires City/Buenos Aires Province/other parts of the country) for each group are summarized in Table 1.

Forty-nine patients were included in the group with DRE; 45 (92%) patients presented with temporal lobe epilepsy, and 4 (8%) patients had frontal lobe epilepsy. Regarding psychiatric disorder prevalence, 33 (67%) patients with DRE and 35 (100%) patients with PNESs met criteria for at least one disorder codified in Axis I of DSM IV ($p < 0.01$).

Considering PNESs as the core syndrome, the most frequent psychiatric disorders codified according to DSM IV criteria were somatoform (conversion) disorder in 88.57% and dissociative disorder in 37.14%, which occurred only in the group with PNESs. Patients with mixed PNESs (conversion/dissociative disorder resembling epilepsy) and DRE were excluded from this study. Other psychiatric comorbidities in Axis I and Axis II were also diagnosed in both groups of patients (Table 2).

Table 1
Sociodemographic data.

	DRE (n = 49) n (%)	PNESs (n = 35) n (%)	*p*[a]
Age, mean (SD)	34.5 (12.5%)	37.54 (14.07%)	0.3 (*t*)
Gender, n (%)			
Female	29 (59.18%)	27 (77.14%)	0.085
Male	20 (40.82%)	8 (22.86%)	
Education			
Less than 12 years	27 (55.1%)	22 (62.86%)	0.37
More than 12 years	22 (44.9%)	13 (37.14%)	
Marital status			
Married	24 (48.98%)	19 (54.28%)	0.61
Single/divorced	25 (51.02%)	16 (45.72%)	
Origin			
Buenos Aires city	17 (34.7%)	14 (40%)	0.79
Buenos Aires province	25 (51.02%)	20 (57.14%)	0.65
Other provinces	7 (14.28%)	1 (2.86%)	0.079
Occupation			
Unemployed	21 (42.86%)	21 (60%)	0.14
Employed	21 (42.86%)	11 (31.43%)	0.17
Students	7 (14.28%)	3 (8.57%)	0.45

(*t*) Student's *t* test.
[a] χ^2 (Chi square test).

Table 2
Psychiatric diagnoses in Axis I (DSM IV).

	DRE (n = 49)	PNESs (n = 35)	*p*[a]
Axis I disorders	33 (67.35%)	35 (100%)	0.003
Somatization disorder	0	2 (5.71%)	0.09
Depression	17 (34.7%)	12 (34.28%)	0.969
Anxiety disorders	8 (16.32%)	14 (40%)	0.015
PTSD	2 (4.08%)	8 (22.85%)	0.009
Psychotic disorders	10 (20.4%)	1 (2.85%)	0.019
Intermittent explosive disorder	5 (10.2%)	0	0.051
Bipolar disorder	0	2 (5.71%)	0.09
Eating disorders	0	1 (2.85%)	0.234
Malingering	0	2 (5.71%)	0.09
Dementia	2 (4.08%)	2 (5.71%)	0.729
More than one Axis I psychiatric disorder	11 (22.44%)	27 (77.14%)	0.002

PTSD = posttraumatic stress disorder.
[a] χ^2 (Chi square test).

The frequency of presentation of psychiatric disorders, codified in Axis I and Axis II, was compared between DRE and PNESs: anxiety disorders, trauma history, posttraumatic stress disorder, and personality cluster B disorders were more frequent in PNESs. Depression was equally prevalent in both groups, while psychosis was more frequent in DRE. Table 2 summarizes the results of the SCID I (Axis I of DSM IV), and Table 3 shows the results of SCID II (Axis II of DSM IV). Two cases of malingering were included in the group with PNESs (this psychiatric diagnosis should be considered in the differential diagnosis).

3.1. Trauma history

Trauma history and sexual trauma were significantly more frequent in the group with PNESs (Table 4). Trauma occurred prior to the seizure onset in all patients, except for one in the group with DRE. One patient in the group with DRE and two patients in the group with PNESs reported more than one trauma event.

3.2. Global assessment of functioning

Patients with PNESs scored significantly lower than patients with DRE in the evaluation of general functioning (Table 5).

3.3. Psychotropic medication

All patients included in this study (100% in both groups) were treated with antiepileptic drugs. Patients with PNESs presented a higher frequency of a psychotropic medication treatment history (Table 6).

4. Discussion

In this study, we determined the psychiatric profile in patients with PNESs and DRE in a population from Latin America (Argentina) and found a significant delay in the recognition of PNESs (eleven years),

Table 3
Psychiatric diagnoses in Axis II.

	DRE (n = 49)	PNESs (n = 35)	*p*[a]
Personality disorders	27 (55.1%)	25 (71.43%)	0.129
Cluster A (paranoid, schizoid, schizotypal)	15 (30.61%)	5 (14.29%)	0.14
Cluster B (antisocial, borderline, histrionic narcissistic)	9 (18.37%)	15 (42.86%)	0.02
Cluster C (avoidant, dependent, obsessive–compulsive)	14 (28.57%)	11 (31.43%)	0.89

[a] χ^2 (Chi square test).

Table 4
Trauma history.

Type of trauma	DRE (n = 49)	PNESs (n = 35)	p[a]
Total	12 (24.5%)	17 (48.57%)	0.02
Sexual	3 (4.08%)	9 (25.71%)	0.007
Violence (traumatic accident, theft, physical abuse)	6 (12.24%)	5 (14.28%)	0.41
Illness or loss of a significant other	3 (6.12%)	3 (8.57%)	0.39

[a] χ^2 (Chi square test).

even longer than other reports (Reuber et. al. estimated a mean delay of 7 years) [6]. Diagnostic delay in Latin America, particularly in Argentina, could in part be accounted for by difficulties in accessing video-EEG. This is possibly related to both economic and availability factors. Indeed, only a limited number of specialized centers in the whole country have ready access to such diagnostic tools, and DRE is a priority for video-EEG, particularly when a surgical procedure is indicated. Diagnostic delay implies unnecessary exposure to antiepileptic drugs [6,7,27] and, in turn, slows appropriate treatment implementation (psychiatric treatment and psychotherapy) [4]. Indeed, all patients who participated in our study were taking antiepileptic drugs at the time of the psychiatric assessment.

In this analysis, similarities and differences in the psychiatric profile were found between DRE and PNESs. The total number of Axis I psychiatric disorders was significantly higher in the group with PNESs. These results are consistent with previous data [6,8,10,16,29]. Psychogenic nonepileptic seizures are classified in Axis I (DSM IV) as somatoform disorders: conversion disorder with seizures or convulsions and/or dissociative disorders. Notwithstanding, PNESs may be part of more heterogeneous psychiatric disorders [1,4,28].

In this sample, anxiety disorders, PTSD diagnosis, and trauma history were significantly more frequent in the group with PNESs. In accordance with these findings, higher scores of anxiety when comparing patients with PNESs with patients with epilepsy were found by other researchers [22,30], and many authors have considered that traumatic experiences may underlie PNES development [31–33]. Psychological mechanisms like dissociation as a defense against early-age overwhelming situations may give rise to and regulate PNESs. Thus, trauma would commonly precede the onset of PNESs [4,7,31,32], and PNESs were proposed as a clinical expression of a "dissociative subtype" of PTSD [33]. Nevertheless, other psychiatric conditions without trauma (personality disorders, other nontraumatic anxiety disorders, malingering) may be associated with PNESs, showing the heterogeneous origin of PNESs [1,4,28,33]. In this work, trauma history and, in particular, sexual trauma were present with a high frequency in the group with PNESs. Similar to our results, even higher rates of trauma were reported in PNES populations in other previous studies ranging from 44% to 100% [10,11,16,32–34]. It is possible that some patients did not report trauma in this study because they do not feel confident enough to report such life events in a routine interview, mentioned elsewhere as "unspeakable dilemmas" [18,34].

Although psychiatric trauma should be considered an important factor in PNESs, it is not pathognomonic of this population [33]. It is noteworthy that a subgroup of patients with DRE in our sample also reported trauma experiences, which is in accordance with previous data [19,29,31]. In line with this, Berkhoff et al. warned that a history of clear psychogenic factors does not protect against developing epilepsy [35].

Table 5
Global assessment of functioning (GAF).

	DRE (n = 49)	PNESs (n = 35)	p (t)
GAF score mean ± SD	69.29 ± 9.07	62.43 ± 9.88	0.001
GAF score range	55–90	40–80	

(t) Student's t test.
SD: standard deviation.

Table 6
Medication.

	DRE (n = 49)	PNESs (n = 35)	p[a]
Psychotropic medication	9 (18.36%)	25 (71.42%)	0.0001
Antidepressants (B)	1 (2.04%)	9 (25.71%)	0.0001
Antipsychotics (C)	7 (14.28%)	3 (8.57%)	0.48
Combination of anxiolytic and B and/or C.	1 (2.04%)	13 (37.14%)	0.0001

[a] χ^2 (Chi square test).

Another important difference between groups was found in personality traits (Axis II). While both groups of patients presented with high prevalence of Axis II disorders, cluster B disorders were significantly more prevalent in the group with PNESs. Cluster B disorders are characterized by emotional instability, and PNESs may constitute one syndrome within a more complex disorder (i.e., borderline personality disorder, the main cluster B personality disorder) [36]. It is interesting to point out that both, patients with borderline personality disorder and patients with PNESs, share a history of developmental trauma, major depression, and PTSD [33] (the most prevalent comorbid diagnoses found in borderline personality disorder) [36].

There are a few studies that used DSM IV criteria in order to analyze personality disorders. Previous findings of our group found cluster B and C personality disorders to be the most prevalent in PNESs [4]; similarly, others have found cluster C personality disorders to be more prevalent in DRE and borderline and avoidant personality disorders in PNESs [20,21]. Turner found a higher incidence of cluster B in the group with PNESs [29], and Alper described dependent personality traits as the dominant type of personality dysfunction in patients with PNESs [8]. Galimberti found a great prevalence of cluster B personality disorders in patients with pure PNESs and patients with mixed PNESs (PNESs + epilepsy) [30]. More recently, Direk et al. found significant differences only in Axis II, with higher prevalence of borderline personality disorder in patients with PNESs [37]. Most importantly, it has been described that the presence of personality disorders represents a poor prognosis predictor when it comes to PNESs [11].

In the present study, psychotic disorders were more prevalent in DRE than in PNESs, and although not statistically significant, there were more prevalent cluster A personality disorders in DRE. Cluster A personality disorders are considered within the schizophrenia spectrum and have been considered as a risk factor for other psychotic disorders [38,39]. Patients with DRE, particularly those with drug refractory temporal lobe epilepsy, have been described as having high rates of psychosis. Risk factors associated with the spectrum of psychotic disorders described in patients with DRE are as follows: bilateral hippocampal sclerosis, a history of status epilepticus, longer duration of epilepsy (>20 years), and the use of new generation antiepileptic drugs [4,40–42].

We found similar rates of depression in both groups. This finding is consistent with previous research [12]. Temporal lobe epilepsy has a strong association with depression and suicide, and it was even suggested that they may share pathogenic mechanisms [43–45]. On the other hand, depression is also prevalent as a comorbid diagnosis in PNESs. Proper diagnosis and treatment of depression in both groups of patients could reduce seizure frequency and improve quality of life [46,47].

Patients suffering from PNESs have general and social functioning deficits related to the limitations of having paroxysmal events (conversion or dissociative symptoms) and the limitations of having a psychiatric condition (Axis I and II comorbidity). It has been reported that patients with PNESs are unemployed or receive economic disability assistance similar to chronic diseases [47] and also have social and interpersonal problems. The majority are not in paid employment. According to our results, general functioning in both groups presented with difficulty in social, occupational, or school functioning. However general

functioning was significantly different between the groups, with poorer psychosocial functioning in patients with PNESs than in patients with DRE.

Although not studied in this research, the management of patients with PNESs requires the involvement of a multidisciplinary treatment team including neurologists, psychiatrists, psychotherapists, and social workers. The implementation of a correct treatment includes a psychoeducational approach and various psychotherapeutic techniques for treating PNES (conversion or dissociative) symptoms. Psychotherapeutic techniques include cognitive–behavioral therapy (CBT), psychoanalytically oriented psychotherapies, hypnosis, and family counseling. Relaxation training and mindfulness-based techniques enhance the potential effectiveness of CBT and the therapeutic relationship, which has been categorized as essential in the treatment of dissociative disorders. Furthermore, a psychiatric treatment including pharmacotherapy may also be required for specific disorders such as depression, considering the heterogeneity of diagnoses [18,28].

The present study has limitations that must be mentioned. In our culture, because of economic difficulties, access to video-EEG in the public system is restricted to a few centers. Epilepsy Center, Ramos Mejía Hospital is one of the first centers in Buenos Aires City where the video-EEG unit was implemented as a tertiary care, as part of the Program of Epilepsy Surgery. In that way, the possibility for epilepsy surgery (DRE cases with structural lesion in MRI) was a priority to perform a video-EEG. Furthermore, surgical candidates with DRE came from other parts of the country (other provinces), especially for this study as part of the surgical program. It is possible that many patients who live in other provinces have no access to the study because of economic barriers.

The small sample size is another important limitation and is probably related to the low prevalence of PNESs confirmed by video-EEG found in this study. Furthermore, the prevalence of PNESs has an important bias (indication of video-EEG is a priority for candidates for epilepsy surgery) and only reflects the frequency of PNESs in the video-EEG unit but not the prevalence of the total population at the ECRMH.

In the last several years, other medical centers have included the video-EEG in the social support programs, facilitating the access to this complementary study to more patients, including patients with suspected PNESs. In that context, we will continue studying the prevalence of PNESs in our population, focusing on psychiatric disorders, psychosocial functioning, and quality of life.

Competing interests

None. This research received no specific grant from any funding agency in the public, commercial or not-for-profit sectors.

Acknowledgment

Peruilh Grant, Buenos Aires University, School of Medicine.

References

[1] Silva W, Giagante B, Saizar R, D 'Alessio L, Oddo S, Consalvo D, et al. Clinical features and prognosis of nonepileptic seizures in a developing country. Epilepsia 2001;42(3):398–401.
[2] Alsaadi TM, Thieman C, Shatzel A, Farias S. Video-EEG telemetry can be a crucial tool for neurologists experienced in epilepsy when diagnosing seizure disorders. Seizure 2004;13:32–4.
[3] Devinsky O. Nonepileptic psychogenic seizures: quagmires of pathophysiology, diagnosis, and treatment. Epilepsia 1998;39(5):458–62.
[4] D'Alessio L, Giagante B, Oddo S, Silva W, Solís P, Consalvo D, et al. Psychiatric disorders in patients with non-epileptic seizures, with and without comorbid epilepsy. Seizure 2006;15:333–9.
[5] Kwan P, Arzimanoglou A, Berg AT, Brodie MJ, Allen Hauser W, Mathern G, et al. Definition of drug resistant epilepsy: consensus proposal by the ad hoc Task Force of the ILAE Commission on Therapeutic Strategies. Epilepsia 2010;51(6):1069–77.
[6] Reuber M, Fernandez G, Bauer J, Helmstaedter C, Elger CE. Diagnostic delay in psychogenic nonepileptic seizures. Neurology 2002;58(3):493–5.
[7] Scévola L, D'Alessio L, Saferstein D, Centurión E, Consalvo D, Kochen S. Psychogenic nonepileptic seizures after head injury: a case report. Case Rep Med 2009;2009:712813.
[8] Alper K. Nonepileptic seizures. Neurol Clin 1994;12(1):153–73.
[9] Leser RP. Psychogenic seizures. Neurology 1996;46:1499–507.
[10] Bowman ES, Markand ON. Psychodynamics and psychiatric diagnosis of pseudoseizure subjects. Am J Psychiatry 1996;153:57–63.
[11] Parra J, Frey M, Stebbins G, Pierre-Louis S, Iriarte J. Psychiatric and neurologic predictors of psychogenic pseudoseizure outcome. Neurology 1999;53(5):933–8.
[12] Lambert MV, Robertson MM. Depression in epilepsy: etiology, phenomenology, and treatment. Epilepsia 1999;40(suppl10):S21–47.
[13] Reuber M, Elger CE. Psychogenic nonepileptic seizures: a review and update. Epilepsy Behav 2003;4:205–16.
[14] American Psychiatric association. Diagnostic and statistical manual of mental disorders. 4th ed. Washington (DC): American Psychiatric association; 1994 .
[15] World Health Organization. The ICD-10 classification of mental and behavioural disorders: clinical descriptions and diagnostic guidelines. Geneva, Switzerland: WHO; 1992.
[16] Bailles E, Pintor L, Fernandez-Egea E. Psychiatric disorders, trauma, and MMPI profile in Spanish sample of non epileptic seizure patients. Gen Hosp Psychiatry 2004;26:310–5.
[17] Reuber M, Pukrop R, Bauer J, Derfuss R, Elger CE. Multidimensional assessment of personality in patients with psychogenic non-epileptic seizures. J Neurol Neurosurg Psychiatry 2004;75:743–8.
[18] Alessi R, Valente KD. Psychogenic non-epileptic seizures at a tertiary care center in Brazil. Epilepsy Behav 2013;26(1):91–5.
[19] LaFrance Jr WC, de Marinis AJ, Webb AF, Machan JT, Rusch MD, Kanner AM. Comparing standard medical care for nonepileptic seizures in Chile and the United States. Epilepsy Behav 2012;25(2):224–9.
[20] Harden C, Jovine L, Buergut FT, Carey BT, Nikolov BG, Ferrando SJ. A comparison of personality disorder characteristics of patientswith nonepileptic psychogenic pseudoseizures with those of patients with epilepsy. Epilepsy Behav 2009;14(3):481–3.
[21] Arnold LM, Privitera MD. Psychopathology and trauma in epileptic and psychogenic seizure patients. Psychosomatics 1996;37:438–43.
[22] Owczarek K. Anxiety as a differential factor in epileptic versus psychogenic pseudoepileptic seizures. Epilepsy Res 2003;52:227–32.
[23] Kochen S, Melcon M. Prognosis of epilepsy in a community-based study: eight years of follow-up in an Argentine community. Acta Scand Neurol 2005;112(6):370–4.
[24] Wechsler D. Test de Inteligencia para adultos (WAIS) Manual. Buenos Aires: Editorial Paidós; 1995 .
[25] First M, Gibbon M, Spitzer R, Williams J, Benjamin L. SCID I. Versión clínica en español: Masson; 1999.
[26] First M, Gibbon M, Spitzer R, Williams J, Benjamin L. SCID II. Versión clínica en español: Masson; 1999.
[27] Kuyk J, Leijten F, Meinardi H, SpinhovenPh, Van Dyck R. The diagnosis of psychogenic non-epileptic seizures: a review. Seizure 1997;6:243–53.
[28] Bodde NMG, Brooks JL, Baker GA, Boon PAJM, Hendriksen JGM, Mulder OG, et al. Psychogenic non-epileptic seizures — definition, etiology, treatment and prognostic issues: a critical review. Seizure 2009;18:543–53.
[29] Turner K, Piazzini A, Chiesa V, Barbieri V, Vignoly A, Gardella E, et al. Patients with epilepsy and patients with psychogenic non-epileptic seizures: video-EEG, clinical and neuropsychological evaluation. Seizure 2011;20(9):706–10.
[30] Galimberti CA, Ratti MT, Murelli R, Marchioni E, Manni R, Tartara A. Patients with psychogenic nonepileptic seizures, alone or epilepsy-associated, share a psychological profile distinct from that of epilepsy patients. J Neurol 2003;250(3):338–46.
[31] Dikel T, Fennell E, Gilmore R. Posttraumatic stress disorder, dissociation, and sexual abuse history in epileptic and nonepileptic seizure patients. Epilepsy Behav 2003;4:644–50.
[32] Fleisher W, Staley D, Krawetz P, Pillay N, Arnett JL, Maher J. Comparative study of trauma-related phenomena in subjects with pseudoseizures and subjects with epilepsy. Am J Psychiatry 2002;159(4):660–3.
[33] Fiszman A, Alves-Leon CV, Gomes Nunes R, D'Andrea I, Figueira I. Traumatic events and posttraumatic stress disorder in patients with psychogenic nonepileptic seizures: a critical review. Epilepsy Behav 2004;5:818–25.
[34] Betts T, Boden S. Diagnosis, management and prognosis of a group of 128 patients with non-epileptic attack disorder. Part II. Previous childhood sexual abuse in the aetiology of these disorders. Seizure 1992;1(1):27–32.
[35] Berkhoff M, Briellmann RS, Radanov BP, Donati F, Hess CW. Developmental background and outcome in patients with nonepileptic versus epileptic seizures: a controlled study. Epilepsia 1998;39:463–9.
[36] Gunderson JG. Borderline personality disorder: a clinical guide. Washington DC: American Psychiatric Publishing; 2001.
[37] Direk N, Kulaksizoglu IB, Alpay K, Gurses C. Using personality disorders to distinguish between patients with psychogenic nonepileptic seizures and those with epileptic seizures. Epilepsy Behav 2012;23(2):138–41.
[38] Fogelson D, Nuechterlein K, Asarnow R, Payne D, Subotnik K. Validity of the family history method for diagnosing schizophrenia, schizophrenia-related psychoses, and schizophrenia-spectrum personality disorders in first-degree relatives of schizophrenia probando. Schizophr Res 2004;68(2–3):309–17.
[39] Cochrane M, Petch I, Pickering AD. Aspects of cognitive functioning in schizotypy and schizophrenia: evidence for a continuum model. Psychiatry Res 2012;196:230–4.
[40] Flor-Henry P. Psychosis and temporal lobe epilepsy: a controlled investigation. Epilepsia 1969;10:363–95.
[41] Kanner AM. Depression and epilepsy: a new perspective on two closely related disorders. Epilepsy Curr 2006;6:141–6.

[42] D'Alessio L, Giagante B, Papayannis C, Oddo S, Silva W, Solís P, et al. Psychotic disorders in Argentine patients with refractory temporal lobe epilepsy: a case–control study. Epilepsy Behav 2009;14(4):604–9.
[43] Kanner AM. Depression in epilepsy: prevalence, clinical semiology, pathogenic mechanisms, and treatment. Biol Psychiatry 2003;54:388–98.
[44] Kanner AM, Schachter SC, Barry JJ, Hersdorffer DC, Mula M, Trimble M, et al. Depression and epilepsy, pain and psychogenic non-epileptic seizures: clinical and therapeutic perspectives. Epilepsy Behav 2012;24(2):169–81.
[45] Calvet E, Caravotta PG, Scévola L, Teitelbaum J, Seoane E, Kochen S, et al. Psychosis after epilepsy surgery: report of three cases. Epilepsy Behav 2011;22(4):804–7.
[46] Cramer J, Blum D, Reed M, Fanning K. The influence of comorbid depression on quality of life for people with epilepsy. Epilepsy Behav 2003;4:515–21.
[47] Lawton G, Mayor RJ, Howlett S, Reuber M. Psychogenic nonepileptic seizures and health-related quality of life: the relationship with psychological distress and other physical symptoms. Epilepsy Behav 2009;14:167–71.