



Contents lists available at ScienceDirect

Epilepsy & Behavior

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

Are there gender differences in those diagnosed with psychogenic nonepileptic seizures?

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ARTICLE INFO

Article history:

Received 27 August 2017

Revised 13 October 2017

Accepted 15 October 2017

Available online xxxx

Keywords:

Psychogenic nonepileptic seizures

PNES

Males

Women

Gender

Psychological trauma

Stress coping

ABSTRACT

Objective: The objective of the study was to determine whether male and female populations of patients with psychogenic nonepileptic seizures (PNES) differ, in terms of demographic, social/clinical, and etiological factors as well as psychological measures.

Background: Psychogenic nonepileptic seizures are overrepresented by females; therefore, information about PNES in males is limited. Only a handful of studies have examined PNES and gender, and of those, one was a literature review and with the exception of two, most have had small sample sizes. Of the existing literature, differences in abuse type, psychiatric diagnoses, and psychometric results have been observed in the two genders.

Methods: This is a retrospective study of 51 consecutive males and 97 consecutive females with video-electroencephalogram (video-EEG) confirmed diagnosis of PNES. Patients were examined on demographics (age, education, working status), clinical (seizure frequency, trauma type: sexual, nonsexual, age of first trauma), and psychometric measures. The latter included the State Trait Anger Expression Inventory-2 (STAXI-2), Trauma Symptom Inventory-2 (TSI-2), the Coping Inventory for Stressful Situations (CISS), and the Quality of Life Inventory in Epilepsy-31 (QOLIE-31).

Results: Women reported experiencing significantly more sexual traumas ($p = 0.007$) than men. Women also endorsed significantly higher levels of dissociation ($p = 0.012$) and sexual disturbances ($p = 0.46$). In contrast, men reported significantly greater use of avoidance ($p = 0.001$) as a stress coping strategy and higher levels of depression ($p = 0.006$).

Conclusions: Gender differences were identified with males reporting a significantly higher use of avoidance (cognitive and behavioral avoidance of stress) and depressive symptoms. Women exhibited significantly higher rates of sexual trauma compared with male counterparts. Consequently, women also had significantly higher rates of trauma symptomatology (dissociation and sexual disturbances) which are often observed in those who have been traumatized sexually. These gender distinctions may support different first-line treatment approaches (e.g., trauma-focused; more traditional cognitive behavioral therapy) depending on the most prominent symptomatology.

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1. Introduction

Psychogenic nonepileptic seizures (PNES) are episodes that look like epileptic seizures but are not caused by sudden abnormal electrical discharges in the brain. Instead, these paroxysmal episodes are typically triggered by emotional distress. Those who carry this diagnosis tend to present with other psychiatric comorbidities including mood, anxiety, trauma, and personality disorders.

It is relatively common to see patients with PNES in outpatient and inpatient epilepsy programs [1]. The incidence of PNES is estimated to be 1.4–4.9/100,000/year [2–4], and the prevalence of PNES is thought to be between 2 and 33 per 100,000 [5].

An interesting and consistently reported feature of PNES concerns the much higher ratio of women to men (3:1) who are diagnosed with this disorder [6–10]. The sex distribution across 21 studies revealed a ratio similar to the one mentioned above [11]. Because of this gender ratio differential, men with PNES are disproportionately underrepresented in most studies of PNES.

Only a handful of studies have examined PNES with regard to the patients' gender. Gender differences in abuse type, psychiatric diagnoses, and psychometric results have been reported [12,13]. However, there are disagreements including discrepant reports of lower or higher rates of previous psychiatric treatment in men [12,13] and identification of more or less emotional maladjustment in men [13,14].

The goal of this study was to investigate whether there are similarities and differences between male and female patients diagnosed with PNES on demographic, clinical, and psychological variables (specifically trauma symptomatology, quality of life (QOL), anger, and stress coping approaches).

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2. Methods

This is a retrospective study of 51 consecutive males (2007 to 2016) and 97 consecutive females (2014 to 2016) with video-EEG-confirmed diagnosis of PNES. The initial number of 115 women with PNES was reduced to 97 (10 due to intellectual disability; 8 dually diagnosed epilepsy/PNES) as was the initial number of 57 men with PNES reduced to 51 (3 due to intellectual disability; 3 dually diagnosed epilepsy/PNES).

Patients were examined on demographics (age, education, working status), and clinical variables (age of PNES onset, trauma [yes/no], trauma type [sexual/nonsexual], age of first trauma, participation in psychiatric treatments during lifetime, hospitalizations, and suicide attempts). Seizure frequency was noted on the day that neuropsychological testing was conducted. For the purpose of this study, frequency was calculated as “seizures per day.” For example, one seizure per week would translate into 1/7 (0.14), one seizure per month would translate into 1/30 (0.03), and three seizures per week would translate into 3/7 (0.43). Psychometric measures were administered by neuropsychologists (RT, KB) as part of the standard Northeast Regional Epilepsy Group neuropsychological battery, typically within a few weeks following PNES diagnosis. Posttraumatic symptomatology, anger, stress coping approaches, and QOL were obtained from these assessments.

Psychometric measures included the Trauma Symptom Inventory-2 (TSI-2) [15], the State Trait Anger Expression Inventory-2 (STAXI-2) [16], the Coping Inventory for Stressful Situations (CISS) [17], and the Quality of Life Inventory in Epilepsy-31 (QOLIE-31) [18].

The TSI-2 is a 136-item self-report measure that is used to evaluate acute and chronic posttraumatic symptomatology in adults. It assesses the effects of sexual and physical assault, intimate partner violence, combat, torture, motor vehicle accidents, mass casualty events, medical trauma, traumatic losses, and childhood abuse or neglect. The clinical scales of the instrument measure the extent to which the respondent endorses trauma-related symptoms: anxious arousal (anxiety and autonomic hyperarousal), intrusive experiences (e.g., nightmares, flashbacks, upsetting memories), defensive avoidance (cognitive and behavioral avoidance of distressing content), dissociation (nonvolitional or automatic disconnection occurring in the usually integrated functions of consciousness, memory, or perception), somatic preoccupations (pain or general health concerns), sexual disturbance (unhealthy sexual behavior or unusual concerns), and suicidality. The TSI-2 has been thoroughly examined regarding reliability and validity. Internal consistencies have been reported for all scales ranging from 0.74 to 0.94, and test–retest coefficients have been reported for all scales ranging from 0.76 to 0.94.

The STAXI-2 is a 57-item self-report measure which has the following scales: State Anger Scale, which measures the intensity of anger feelings and the extent to which a person feels like expressing anger at the time the questionnaire is filled out; and the Trait Anger Scale, which measures how often angry feelings are experienced over time, and thus, provides a sense of the degree to which anger may or may not be a chronic part of the person's temperament. Satisfactory factor loadings for the 57 items and adequate concurrent validity have been determined between the STAXI-2 subscales and other measures of hostility and personality (Minnesota Multiphasic Personality Inventory (MMPI) Hostility scale, Eysenck Personality Questionnaire, etc.).

The CISS is a 48-item paper-and-pencil self-report scale that was developed to assess three coping strategies that the respondent typically uses when confronted with stressful situations: Task-Oriented, Emotion-Oriented, and Avoidance-Oriented. The adult version of the CISS is based on three normative samples including adults (249 males, 289 females), college students (471 males, 771 females), and psychiatric inpatients (164 males, 138 females). Respondents indicate how frequently they engage in the 48 types of activities when encountering a difficult, stressful, or upsetting situation. Validity of the multidimensionality of the CISS scales and construct validity of the scales have

been examined with college, adult, and inpatient samples. Factor analysis produced congruence coefficients comparing each of the three factors above 0.95 for all three samples. This demonstrates that the CISS independently assesses for the Task-Oriented (e.g., focus on the problem and see how well I can solve it), Emotion-Oriented (e.g., get angry, get upset), and Avoidance focused (e.g., go out for a snack or meal, go to sleep) scales.

The QOLIE-31 contains seven multiitem scales, which measures several QOL domains, including the following: emotional wellbeing, social functioning, energy/fatigue, cognitive functioning, seizure worry, medication effects, and overall QOL. In this study, all of these scales were included with the exception of cognitive functioning and overall QOL.

Statistical analysis: The Kolmogorov–Smirnov and Shapiro–Wilks tests were used to determine whether the distribution was normal, and it was concluded that most scale variables used were not normally distributed. The variability of each group of variables was tested for both genders by including them as predictors into a logit model for Sex = “male” and running a likelihood ratio test to assess their effect as a group. Whenever necessary to adjust for a specific set of covariates, all were included, and then a backward stepwise selection was used. Only the covariates that were statistically significant were maintained. Throughout the analysis, a *p* value of less than 5% was used for significance. The Institutional Review Board (IRB) approval for an anonymous archival record review was obtained with removal of nonrelevant personal health information (PHI) (Copernicus IRB NRE1-11-155).

3. Results

For females, mean age was 37 ± 13.29 , and years of education were 13.69 ± 2.21 . In the male sample, mean age was 34.35 ± 13.43 , and years of education were 12.73 ± 3.16 . No statistically significant differences in demographic (age, education, or employment status) or clinical variables (age onset, suicide attempt, or psychiatric hospitalization) were identified, with the exception of past/present psychiatric history; males reported having significantly greater utilization of mental health treatment services ($\chi^2 = 11.4916$, $p = 0.000699$) (Table 1). Significant gender differences were also identified in frequency of psychogenic events, with approximately 30% of men having ≥ 1 episode each day ($p < 0.004$).

Patients reported experiencing a variety of traumatic events (Table 2). These were classified as either sexual in nature, including childhood sexual abuse and rape, or as nonsexual trauma that included physical abuse, verbal abuse, assault, witnessing the abuse of another, spousal abuse, bankruptcy (which had led to homelessness or foster care), death of a parent, major illness, military trauma, bullying, conviction that led to prison, kidnapping, and torture (e.g., prolonged confinement of a child in a dark basement with limited food, kidnapping, and physical torture of a South American woman, and unlawful confinement at home for 3 others reporting variable amounts of time, during which they were terrified, beaten, tied at times, and forcibly

Table 1

Demographic and clinical variables in sample of men ($n = 51$) and women ($n = 97$) diagnosed with PNES.

	Men: mean/SD or %	Women: mean/SD or %	<i>p</i> value
Employed	26%	27%	ns
Age PNES onset	34 ± 12.66	27.28 ± 13.85	ns
Received mental health care (past/present) (y/n)	73%	43%	0.0006*
Suicide attempt (y/n)	14%	18%	ns
Psychiatric hospitalization (y/n)	31%	28%	ns

SD: standard deviation; ns: not significant.

* $p < 0.05$.

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