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Psychiatric and neuropsychological profiles of people with psychogenic nonepileptic seizures

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ABSTRACT

Objective: This study examined the psychiatric and neuropsychological profiles of people with psychogenic nonepileptic seizures (PNES).
Methods: Twenty-people who had been diagnosed with psychogenic nonepileptic seizures (PNES), but not epilepsy, were recruited into this study. A healthy control group was also recruited and was matched for age and gender. All participants underwent structured psychiatric assessment and psychometric assessment. Neuropsychological assessment was carried out using the Cambridge Neuropsychological Test Battery (CANTAB) after participants passed the Medical Symptom Validity Test (MSVT) of effort.
Results: One patient failed the MSVT and was excluded from the analysis. Therefore, data from 19 people with PNES and their matched healthy controls were analyzed. Compared with controls, people with PNES had significantly higher levels of depressive symptoms, anxiety symptoms, dissociative experiences, and alexithymic traits. In addition, people with PNES had impairments in spatial working memory and attention when compared with healthy controls.
Conclusion: To our knowledge, this is the first study to report that, compared with controls, people with PNES have abnormal cognitive functioning after controlling for effects of effort and FSIQ. People with PNES also have high levels of anxiety, depressive, and dissociative symptoms. In addition, they appear to particularly focus on health problems and show evidence of chronic emotional dysregulation. Further studies are required to replicate our results and to help clarify the pathogenic mechanisms underlying PNES.

1. Introduction

Psychogenic nonepileptic seizures (PNES) are episodes of altered movement, sensation, or experience resembling epileptic seizures but have no electrophysiological brain correlates [1]. Psychogenic nonepileptic seizures are diagnosed after neurological, medical, and video-electroencephalography (vEEG) assessments confirm that the events are not epileptic in nature and have no other physical explanations (such as cardiogenic syncope). The age at onset of PNES is approximately 23 years, with a prominent gender split, and the preponderance of patients are women by a ratio of 3 to 1 [2].

We and others reported that 20–25% of patients who attend neurology centers for treatment of epilepsy and 20–30% of adult inpatients having inpatient VEEG monitoring have psychogenic nonepileptic seizures (PNES) [1,3]. Delayed diagnosis of PNES is associated with direct and indirect costs to patients, health-care providers, and society [1–3].

In current psychiatric classification systems, an individual with PNES is classified as having a conversion disorder, a process whereby

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intrapsychic distress is converted into physical neurological symptoms [2]. There is consistent evidence that, compared with people with epilepsy, those with PNES have higher levels of anxiety, depressive, somatisation, and conversion symptoms on personality assessment and a relatively high frequency of personality disorders [4]. In addition, we and others have reported high rates of alexithymia, a personality trait characterized by deficits in emotional recognition and processing, in people with PNES [5,6]. However, in the absence of any other clinical investigation to confirm the diagnosis of PNES, vEEG remains the gold standard to discriminate PNES from epilepsy.

It has been proposed that people manifest PNES as a result of an as-yet-unknown psychophysiological process that occurs in response to stress [6]. The manifestation of PNES has been associated with a range of interacting psychosocial stressors [1], and studies have found that, compared with healthy control subjects, people with PNES have poorer memory performance under conditions of social distraction [7], suggesting that they have an abnormally increased stress response.

People with PNES may also have differences in neurocognitive functioning [4]. Some of the earliest studies compared performance on neuropsychological testing between groups of people with PNES, epilepsy, and mixed PNES and epilepsy. However, results from those studies were inconsistent. For example, people with PNES were reported to perform better [8], worse, or no different [9,10] on a range of tests compared to people with epilepsy. Subsequent studies suggested that neuropsychological deficits reported in PNES were indicative of factors such as emotional disturbance, personality disturbance, and suboptimal motivation [11]. Since then, suboptimal effort during neuropsychological testing, in particular, has been highlighted as a frequent finding in people with PNES compared with patients with epilepsy and associated with poor neuropsychological performance [12]. Therefore, it is possible that in those early studies, variable levels of effort between participants contributed to inconsistent neuropsychological findings.

Several studies have evaluated indices of suboptimal performance of patients with PNES on neuropsychological testing. Bakvis and colleagues used the Amsterdam Short-Term Memory Test (ASTMT) to examine effort and compared patients with PNES and a healthy control group on performance of a specific working memory test under baseline and stressful conditions [7]. Although the authors used one index of symptomatology (SCL-90-R) and one neuropsychological test, the intelligence quotients of participants were not controlled for with formal assessment. Locke and colleagues examined the relationship of composite indicators of neuropathology, psychopathology, and effort to neuropsychological results in patients with epilepsy and PNES and found that patients with PNES had relatively higher cortisol stress responses and impaired cognitive integrative functioning [13]. They recorded participants' scores on the Test of Memory Malingering (TOMM) but did not directly compare groups on this measure. The sample included patients with neurological abnormality, but patients were not formally psychiatrically assessed, and affective symptoms were not measured. A notable finding was a significant relationship between effort and scores on all cognitive domains apart from executive functioning. In addition, neuropathology was related to memory functioning in both groups. A further study compared neuropsychological functioning of women with PNES with that of people with epilepsy, including scores on the TOMM [12]. The authors excluded participants who failed the TOMM from the analysis. They reported no abnormal neurocognitive findings in the group with PNES using normative data for the tests and found that the group with PNES generally outperformed the group with epilepsy.

In summary, these findings suggest that people with PNES have abnormalities of neurocognitive and emotional processing. However, there is convincing evidence that neuropsychological performance in PNES is affected by variables such as neuropathology, psychopathology, stress, and performance effort. While Strutt and colleagues reported impaired neuropsychological functioning while controlling for effort in women with PNES only, the generalizability of these results is unclear [12]. Moreover, the results of prior studies have to be interpreted cautiously because of differences in sampling and methods of psychiatric, psychometric, and neuropsychological test assessments and analyses. Therefore, we used comprehensive medical, psychiatric, psychometric, and neuropsychological assessments of patients with PNES and employed a test of effort to, firstly, examine neuropsychological functioning and, secondly, to determine if findings could be used to help identify patients with PNES in the clinical setting. We hypothesized that, compared with age- and gender-matched controls, people with PNES (1) have elevated rates of psychopathology including increased rates of dissociation and emotional dysregulation and (2) have significant differences in attention and cognitive processing.

2. Methods

2.1. Settings for study

This multisite study was conducted at the Royal College of Surgeons in Ireland (RCSI) and Trinity College Dublin (TCD) academic centers and at Beaumont Hospital (BH) and Cork University Hospital (CUH) clinical centers.

2.2. Sample

Patients diagnosed with PNES without comorbid epilepsy in the three years prior to and during the period of this study were identified from case registers and invited by letter to participate in this research project. All participants had a comprehensive neurological examination comprising physical assessment, structural neuroimaging, and vEEG monitoring. Moreover, all participants met the gold standard for "diagnosis with high confidence" of PNES according to a recent consensus guideline, where the diagnosis is made on the basis of both patient history and a typical seizure-like event is observed, simultaneously co-registered with EEG [14]. The study was approved by each center's research ethics committee, and all participants provided written informed consent for involvement in the study. Patients were included if all of the following criteria were met: if they had been diagnosed with psychogenic nonepileptic seizures after capture of a typical seizure-like event on vEEG monitoring; if they had experienced multiple seizure-like events; and if neurological and structural MRI examinations excluded demonstrable neurological abnormality.

Patients diagnosed with PNES while under the age of 18 years were excluded. Other exclusion criteria were a history of comorbid neurological or endocrine disorder, intellectual disability, difficulties in reading or writing, and major psychiatric illness including psychotic disorder or substance abuse. No subject had been taking anticonvulsant medication within three months of participation. Clinical data were gathered from participants' self-report and from both hospital and primary physician medical records. Of forty patients identified from case registers as having PNES, twenty met the criteria for inclusion in the study and agreed to participate.

Control participants were recruited on-site and through webmail advertisement at BH, TCD, and RCSI and by inviting those who previously participated in research projects (research registers) at the relevant academic centers. Control participants were included if they were physically healthy and did not meet any exclusion criteria. They were also matched for gender and age with the group with PNES.

2.3. Clinical interview

All participants underwent a structured clinical interview for DSM-IV for both axis 1 and II disorders (SCID-I and SCID-II). We administered all six sections of the SCID-I and assessed for all ten of the 10 DSM-IV personality disorders using the SCID-II. Our assessment also gathered information on medical and psychiatric histories and basic demographic information including age, gender, race, and number of years spent in education. Additional clinical data in those with PNES, such as age at