

## Neuropsychological Aspects of Psychogenic Nonepileptic Seizures

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### ABSTRACT

Psychogenic nonepileptic seizures (PNES) may be defined as paroxysmal changes in behavior that are similar to epileptic seizures but are not associated with quantifiable alterations in the electrical activity of the brain. At the Epilepsy Surgery Program (ESP) of the São Lucas Hospital at PUCRS (HSL-PUCRS), we studied 52 individuals (37 females and 15 males) with a diagnosis of PNES, associated (57%) or not (23%) with refractory epileptic seizures. We found emotional abuse (100%), physical abuse (80%), emotional neglect (80%), physical negligence (70%) and sexual abuse (30%), mood (40%) and anxiety disorders (50%), as the main psychological components in such population. Although the medical and psychosocial impact of PNES can be estimated as significant, the absence of specialized services for its treatment is striking. Multiple diagnostic and therapeutic procedures and the participation of a specialized multidisciplinary team – where neuropsychology functions as a link between the mental processes/psychopathologies and the brain – are required to ensure proper management of such cases.

**Key words:** psychogenic nonepileptic seizures, neuropsychological evaluation.

### RESUMO

#### *Aspectos neuropsicológicos de crises não-epilépticas psicogênicas*

Crises não-epilépticas psicogênicas podem ser definidas como episódios de alterações paroxísticas no comportamento, similares a crises epilépticas, porém não associadas a alterações quantificáveis da atividade elétrica cerebral. No Programa de Cirurgia de Epilepsia do Hospital São Lucas da PUCRS estudamos 52 indivíduos (37 mulheres e 15 homens) com o diagnóstico de CNEP, associadas (57%) ou não (23%) a epilepsia refratária. Aspectos psicológicos nesta população incluíram abuso emocional (100%), abuso físico (80%), negligência física (70%), abuso sexual (30%), desordens de humor (40%) e ansiedade (50%). O impacto médico e psicossocial deste diagnóstico é elevado, fazendo contraponto a carência de serviços especializados em seu tratamento. Múltiplos procedimentos diagnósticos e terapêuticos e a participação de um time multiprofissional – onde a neuropsicologia representa o elo natural entre a psicopatologia e o cérebro – são necessários para o melhor atendimento a estes pacientes.

**Unitermos:** crises não-epilépticas psicogênicas, avaliação neuropsicológica.

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Psychogenic nonepileptic seizures (also referred to as pseudoepileptic or hysterical seizures) are paroxysmal changes in behavior that are similar to epileptic seizures but are not associated with quantifiable alterations in the electrical activity of the brain.<sup>1</sup>

Kurcgant et al.<sup>2</sup> refer that psychogenic nonepileptic seizures (PNES) are “recurrent seizures, attacks or seizures that may be mistaken for epilepsy due to the similarity of behavioral manifestations but which are not a result of abnormal brain discharges”.

A few authors define them as a somatic communication of mental suffering, usually in response to a psychological conflict or other stressors. Indeed, it is known that a number of psychiatric disorders often arise as psychogenic nonepileptic seizures, the dissociative/conversive and somatoform disorders being the most common ones, occurring in as many as 87% of the cases.<sup>3</sup>

There is evidence that about 5-20% of the patients diagnosed with epilepsy present PNES, and this percentage ranges from 10 to 40% in epilepsy care centers. The percentage is greater, however, among individuals with a diagnosis of refractory epilepsy, ranging from 20 to 45%.<sup>4-7</sup> Among these patients, about 75% are females in the 20-30 years age bracket.<sup>8-11</sup>

The main psychiatric co-morbidity in patients with epilepsy is depression.<sup>12</sup> Blum<sup>13</sup> conducted a study in the USA and found that 29% of the patients with epilepsy presented a depressive state as against the 9% found for the general population. Therefore, this may be an explanation for the high rate of women with PNES, as women are twice as likely as men to suffer from depression.<sup>14,15</sup>

On the other hand, studies<sup>16</sup> suggest an elevated risk of PNES in patients who experienced trauma in childhood (such as emotional, physical or sexual abuse or negligence), as these may trigger a cascade of psychological and neurobiological events, thus altering the patterns of neurotransmission and affecting cognition, affect and behavior.

These experiences may trigger PTSD (post-traumatic stress disorder), which is defined by the DSM-IV as a symptomatic response involving revival, avoidance, numbness, and increased vulnerability to a stressor. Fisman et al.<sup>16</sup> have reviewed 17 articles on the prevalence of PTSD in individuals with a diagnosis of PNES and found that 44-100% of PNES patients had experienced some sort of trauma and 23-77% some sort of abuse. This indicates PTSD as a significant risk factor for the development of PNES. In addition, females are more likely to develop PTSD because they are more susceptible to trauma and abuse, this being one further explanation for the high rate of PNES among women.

Studies assessing cognitive function through neuropsychological testing found impairments among individuals with PTSD, which included verbal and visual memory,

attention, and executive functions.<sup>17</sup> Therefore, these changes must be investigated through a neuropsychological assessment as an additional resource in the clinical evaluation of patients with PNES.

In the Epilepsy Surgery Program (ESP) of the São Lucas Hospital at PUCRS (HSL-PUCRS), the sample studied, was consisted of 52 individuals (37 females and 15 males) with a diagnosis of PNES, associated or not with refractory epileptic seizures. The diagnose was confirmed by video-EEG monitoring during hospitalization for treatment of refractory epileptic seizures.

In this group, 57% present refractory epileptic seizures associated with psychogenic nonepileptic seizures and 23% only psychogenic nonepileptic seizures.

The mean age among these patients did not differ across genders and was around thirty years of age. Most of these patients have finished elementary school. As for marital status, most of the females were single and most of the males were married.

We found a significant incidence of childhood traumas in the patients, including emotional abuse (100%), physical abuse (80%), emotional neglect (80%), physical negligence (70%) and sexual abuse (30%), as well as neuropsychiatric disorders, particularly mood (40%) and anxiety disorders (50%).

In this Program the following tests for neuropsychological evaluation are administered: Rey Complex Figure Test, Boston Naming Test (BNT), Rey Auditory-Verbal Learning Test (RAVLT), Wechsler Memory Scale-R (WMS-R), and the Block Design and Vocabulary subtests of the Wechsler Intelligence Scale for Adults (WAIS-III).

Patients are also submitted to neuropsychiatric evaluation using the Mini International Neuropsychiatric Interview (MINI), which is a semi-structured interview based on DSM-IV and CID-10, in order to identify psychiatric disorders, and the Childhood Trauma Questionnaire (QUESTI). The Childhood Trauma Questionnaire (QUESTI) is a self-applied tool for adolescents and adults designed to investigate histories of abuse and neglect in childhood.<sup>18</sup> Five components are assessed (physical abuse, emotional abuse, sexual abuse, physical neglect and emotional neglect) through a five-option scale ranging from “never happened” to “always happened”. It has as well a control scale of unanswered responses.

The psychological determinants of psychogenic nonepileptic seizures are still unclear. Research has been conducted to specify these determinants, such as the one performed by Owczarek<sup>19</sup>. The purpose of the reported study was to carry out a psychological analysis of personality profiles of patients with psychogenic nonepileptic seizures and epileptic seizures using the results of Minnesota Multiphasic Personality Inventory test (MMPI) for the assessment of conversion as a possible

mechanism for the occurrence of psychogenic nonepileptic seizures. The studied subjects were divided into two groups: *group I* of 30 subjects (25 women and 5 men) with exclusively psychogenic nonepileptic seizures, and *group II* of 27 subjects (23 women and 4 men) with exclusively epileptic seizures. The averaged profiles of these groups were statistically significantly different in their level of hypochondria (Hs- $p < \text{or} = 0.001$ ) and hysteria (Hy- $p < \text{or} = 0.005$ ), and were significantly much higher in patients with psychogenic nonepileptic seizures than the depression parameter (D) ( $p < \text{or} = 0.001$ ). Patients with epilepsy had the highest values of depression (D), while Hs and Hy were statistically significantly lower ( $p = 0.01$ ). A subscale analysis has corroborated the role of conversion in psychogenic nonepileptic seizures.

Many are the difficulties encountered by staff members in the care of the patients with psychogenic nonepileptic seizures (PNES), since usually they are more prepared for treating epileptic seizures (ES). The PNES lie on the border of neurology and psychiatry/psychology, and the health professionals do not move easily across these fields. In this sense, neuropsychology plays an important role within multiprofessional care teams, as it is a specialty concerned with the interrelations between brain, behavior and cognition.

Another major factor to consider concerns those patients presenting both ES and PNES, which makes differential diagnosis even more complex. In these cases, the borders between psychic and organic seem to blur since both drug therapy and surgical intervention can reduce the epileptic seizures while the psychogenic ones remain and usually require other therapeutic measures to be considered. At the centers for the clinical and surgical treatment of epilepsy, this specific principle concerning the need for treatment of psychological aspects has been under the responsibility of Neuropsychology. Establishing a therapeutic relationship based on trust and providing accurate information on the diagnosis are vital. Although a number of treatments have been proposed, such as behavioral, psychodynamic and family therapies, these have not yet been much studied. The treatment must be specific to the mental disorder presenting as psychogenic nonepileptic seizures, according to the basic psychiatric disorder, and include psychotherapy and psychotropic drugs.

As regards differential diagnosis, which occasionally can be extremely difficult, it must be established by a multidisciplinary team. Based on a set of procedures including the patient's life history, detailed clinical history (presence and types of aura, age of onset, etiology), together with physical and neurological testing (electroencephalogram, neuroimaging) and neuropsychologic assessment, suggestive evidence for the diagnosis of psychogenic seizures can be gathered. Even if truly psychogenic seizures are effectively diagnosed, the trend has been to consider them as conversive seizures.

From a more psychological perspective, psychogenic seizures would be like a somatization process in which the individual makes use of his/her body in the form of complaints and/or physical symptoms, whose source is assumed to be psychic in nature. In his first theory of anguish, Freud holds that these bring about unexplained body symptoms, called neuroses. Patients who have psychogenic nonepileptic seizures use their own body as a means of expressing this anguish.<sup>20</sup>

During the neuropsychological anamnesis, it is crucial to focus on those aspects that appear to be related and have increased the suspicion of psychogenic nonepileptic seizures, since patients with psychogenic seizures presenting conversive reactions have risk factors that are common in neuroses, such as sexual and childhood abuse.

The Table 1 shows some parameters that merit consideration.

**Table 1.** Historical data that increase the likelihood of psychogenic epileptic seizures.

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**Family background**

- Absence of epilepsy or feverish seizures
- Presence of dysfunctional family
- Presence of psychiatric disorders

**Personal background**

- Absence of neurological damages
- Absence of seizures in childhood (either feverish or not)
- Presence of sexual abuse in childhood
- Presence of suicide attempts
- Presence of sexual maladjustment
- Presence of formal psychiatric disorders

**Biographical data**

- Experience with epilepsy (either professional or personal)
- Female sex

**Seizures history**

- High rate of seizures
- Onset after 20 years of age
- Spontaneous remissions
- Absence of any response to antiepileptic drugs (AEDs)
- Absence of incontinence or biting the tongue
- Absence of night seizures (while asleep)
- Absence of traumatic falls and/or other traumas
- Occurrence in closed spaces, only in the presence of others, or only in the absence of others
- Emergency care or repeated hospitalizations without defined findings
- Atypical seizures,\* multiple types of seizures, or absence of a stereotyped pattern

**Psychological/Psychiatric Aspects**

- Disregard or overreaction
- Primary or secondary gain
- Specific and forthcoming emotional trigger
- Presence of multiple somatizations
- Doctor-shopping
- Difficulties in the physician-patient relationship
- Presence of psychiatric disorders, particularly anxiety mood disorders

**Neurological examination**

- Normal neurological exam
- Absence of cognitive organic alterations

**Supporting tests**

- Several normal interictal EEGs
  - Normal SPECT/CT/MRI
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\* The description herein does not correspond to the models of the International Classification of Seizures (modified by Marchetti & Damasceno, 2000).

## CONCLUSION

An early differential diagnosis of psychogenic nonepileptic seizures improves the prognosis and decreases the psychosocial impact of the disease.<sup>21</sup> This diagnosis, based on the clinical manifestations of the seizures, increases the efficiency of the investigative process in terms of time and economy in the search of alternative diagnoses to be investigated in increasingly complex ways. Different information on patient history or clinical signs can suggest the presence of PNES, but no single fact can be characterized as pathognomonic.

Video-EEG monitoring is crucial for the differential diagnosis of epilepsy from PNES, once the presence of typical manifestations of the referred seizures in the clinical history are unaccompanied by discharges, particularly if they are triggered and/or terminated by suggestion. A novel alternative for the potentialization of the differential diagnosis by video-EEG is the ictal SPECT. For diagnostic confirmation of the recordings of nonepileptic events during video-EEG monitoring, they must be compared with those witnessed by the patient's family or close observers.

Although the medical and psychosocial impact of PNES can be estimated as significant, the absence of specialized services for its treatment is striking. Many are the cases of PNES patients in neurological and psychiatric services without a specific diagnosis and treatment. However, many of these patients could benefit from focused treatments and be reintegrated into society. To achieve this end, we need multiple diagnostic and therapeutic procedures and the participation of a specialized multidisciplinary team, where neuropsychology is a link between the mental processes/psychopathologies and the brain.

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