Review

Subgroup classification in patients with psychogenic non-epileptic seizures

N.M.G. Bodde [a,*], S.J.M. van der Kruijs [a], D.M. Ijff [a], R.H.C. Lazeron [a], K.E.J. Vonck [d], P.A.J.M. Boon [a,d], A.P. Aldenkamp [a,b,c]

[a] Epilepsy Center Kempenhaeghe, Heeze, The Netherlands
[b] Department of Neurology, Maastricht University Hospital, The Netherlands
[c] Research School Mental Health and Neuroscience, Maastricht University, The Netherlands
[d] Department of Neurology, Ghent University Hospital, Belgium

ABSTRACT

Introduction: In this open non-controlled clinical cohort study, the applicability of a theoretical model for the diagnosis of psychogenic non-epileptic seizures (PNES) was studied in order to define a general psychological profile and to specify possible subgroups.
Methods: Forty PNES patients were assessed with a PNES "test battery" consisting of eleven psychological instruments, e.g., a trauma checklist, the global cognitive level, mental flexibility, speed of information processing, personality factors, dissociation, daily hassles and stress and coping factors.
Results: The total PNES group was characterized by multiple trauma, personality vulnerability (in a lesser extent, neuropsychological vulnerabilities), no increased dissociation, many complaints about daily hassles that may trigger seizures and negative coping strategies that may contribute to prolongation of the seizures. Using factor analysis, specific subgroups were revealed: a 'psychotrauma subgroup', a 'high vulnerability somatizing subgroup' (with high and low cognitive levels) and a 'high vulnerability sensitive personality problem subgroup'.
Conclusion: Using a theoretical model in PNES diagnosis, PNES seem to be a symptom of distinct underlying etiological factors with different accents in the model. Hence, describing a general profile seems to conceal specific subgroups with subsequent treatment implications. This study identified three factors, representing two dimensions of the model, that are essential for subgroup classification: psychological etiology (psychotrauma or not), vulnerability, e.g., the somatization tendency, and sensitive personality problems/characteristics ('novelty seeking'). For treatment, this means that interventions could be tailored to the main underlying etiological problem. Also, further research could focus on differentiating subgroups with subsequent treatment indications and possible different prognoses.

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1. Introduction

About 25–30% of the patients referred to tertiary epilepsy centers or specialized hospitals have psychogenic non-epileptic seizures (PNES) [1–4]. A psychogenic non-epileptic seizure is defined as a clinically observable paroxysmal change in behavior or consciousness that resembles an epileptic seizure but is not accompanied by the typical electrophysiological and behavioral changes that accompany an epileptic seizure. There is also an absence of any known organic etiology for the seizures, whereas there is positive evidence or a strong suspicion for the existence of psychogenic factors [3,5–7].

Earlier research in the field of PNES has mainly focused on the differential diagnosis with epileptic seizures. The correct medical diagnosis of PNES remains a challenge, but since the introduction of simultaneous video-EEG monitoring, the differential diagnosis of PNES-epilepsy has greatly improved [1,8–11]. The true challenge in the diagnostic process of PNES, however, is not only to exclude epilepsy and other organic factors but also to avoid that PNES becomes a 'nondisease' [12]. A subsequent positive diagnosis is required involving the underlying psychological mechanisms [7,9,13,14]. There is consensus that in most patients, multiple underlying psychogenic factors or mechanisms are involved in different combinations and with variable effects on prognosis [15,16].

In a small group of PNES patients, the communication of the PNES diagnosis in a clear, empathic way will result in seizure reduction

* Corresponding author at: Department of Behavioral Research and Psychological Services, Epilepsy Center Kempenhaeghe, PO Box 61, 5590 AB Heeze, The Netherlands. Fax: +31 40 2260426.
E-mail address: Bodden@kempenhaeghe.nl (N.M.G. Bodde).

[7,17–19]. However, patients with PNES comprise a very heterogeneous patient group [20–24]. Several studies report that for many PNES patients, the long-term prognosis is not good. In about 1/3 to 1/4 of the patients, PNES become chronic [7,25]. Patients often show 'medical shopping' in a search for second opinions. Also, symptom characteristics may shift from seizures to other psychosomatic symptoms mimicking e.g., movement disorders [26,27]. As a result, the patients remain in a purely medical environment and are not referred to appropriate psychological therapy [28,29].

To achieve optimal therapeutic outcome, the choice of treatment should be adjusted to the individual patient's combination of underlying etiological factors [7,9,15,29,30]. Recently, we have proposed a theoretical model distinguishing five different levels representing specific underlying psychogenic factors (see Fig. 1) [6,7]. This model was derived from a literature search on psychological etiology and PNES. The model resembles other models with predisposing, precipitating and perpetuating factors to explain somatoform disorders [16,31–33], but more specific factors have been added in relation to PNES. *Level 1, psychological etiology*, refers to factors involved in the causation of PNES, such as sexual abuse or other traumatic experiences [34–37]. However, not all people who have had traumatic experiences develop PNES [38,39]. Many authors have pointed to the specific vulnerability of PNES patients both in terms of their emotional profile and their neuropsychological functioning. Examples are personality factors, gender and age [9,26,29,40–44]. Also, possible organic factors, such as head trauma, may induce higher vulnerability [45–47]. *Level 2, vulnerability*, therefore, refers to characteristics that predispose a person to develop psychosomatic symptoms, such as PNES. *Level 3, shaping factors*, refers to factors that explain why the symptoms are 'seizures' and not for example, functional movement disorders, sleep disorders or 'headache-like symptoms'. A shaping factor may be a close friend or a relative with epileptic seizures (symptom modeling) (see [20,48]) or having had epilepsy in the past. *Level 4, triggering factors*, refers to factors that create circumstances or specific situations that provoke a seizure at a specific moment, such as PNES during school break or after a marital quarrel [49,50]. Also, psychological mechanisms that transfer an emotional state into a seizure can be part of these triggering factors, such as dissociation and somatization [1,14,21,51,52]. Such factors explain why seizures occur on a specific day, or in a cluster or why there is a period of remission. This distinguishes PNES from conversion states that generally have a more permanent presentation. *Level 5, prolongation*, refers to factors that are important in explaining why the seizures persist over time and PNES may become a chronic disorder. These factors determine its frequency and its resistance against therapy. Such modulating factors are, e.g., the coping style of the patient and secondary gain aspects [9,49,53].

Fig. 1 describes the assumed relationship between the factors. The model is not conclusive as some factors can interact at different levels. Coping strategies may be involved in the causation of PNES and may have a role in the vulnerability, whereas family factors may contribute to the prolongation of seizures and not only in the development [54].

The current study focuses on the applicability of this model in the diagnosis of PNES. Relevant and available tests covering the different factors of the model were used to identify dominant factors for the total group and for specific subgroups. There was a focus on subgroups since many factors have been related to PNES but seldom account for the patient group as a whole [7,23,24,52,55,56]. Recent studies increasingly focus on finding criteria to differentiate subgroups in PNES using PNES phenomenology [57], descriptive patient characteristics [58], personality factors and/or cognitive functioning [9,24]. As yet, these criteria were not investigated using a diagnostic model. In this study, tests used in clinical practice were integrated in the diagnostic model in order to systematically assess relevant factors and subgroups.

2. Methods

2.1. Participants

Patients were consecutively included when:

1. The PNES diagnosis had been confirmed in the tertiary referral epilepsy center using clinical description and additional EEG investigations (such as video-EEG monitoring). The type of EEG investigation was based on clinical indications, such as patient history and seizure semiology.
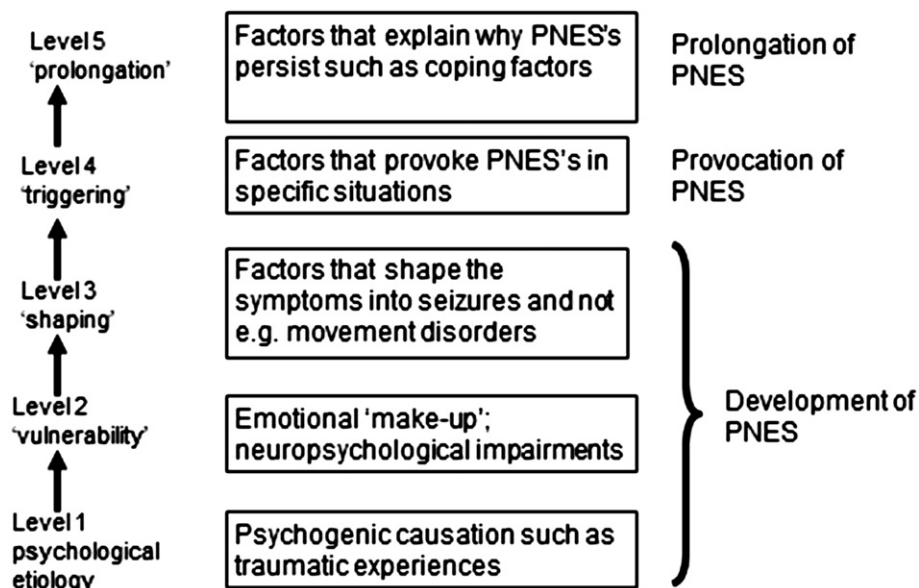2. The diagnosis was confirmed in the period 2009–2010.
3. They were >15 years old.

Fig. 1. Diagnostic model of psychogenic factors involved in psychogenic non-epileptic seizures [6,7].