

## Stress, seizures, and epilepsy: Patient narratives

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### ARTICLE INFO

#### Article history:

Received 30 November 2017

Revised 2 January 2018

Accepted 4 January 2018

Available online xxxx

#### Keywords:

Epilepsy

Seizures

Trigger

Stress

Narratives

### ABSTRACT

In epilepsy, individual seizures can be triggered by a variety of external and internal stimuli. One of the most common trigger factors reported by patients is stress. However prevalent, stress-related triggering of episodes seems underappreciated in epilepsy for various reasons, and its misinterpretation often leads to other diagnoses, e.g., psychogenic nonepileptic seizures (PNES) or normal reactions. This article illustrates the significant role of stress as a seizure-provoking factor by referring to nine patient narratives. From this perspective, it appears that there are characteristic patterns of stress triggering, e.g., stress-induced sleep disruption, forms of acute stress, or relaxation after stress. Sometimes seizures are mistaken as symptoms of stress. Patient narratives contain interesting clues relating reports about stress and seizure histories to different epilepsy syndromes as well as nonepileptic episodes in a way that can strongly support the diagnostic process. A narrative approach is particularly valuable in this context. Therefore, accounts of stress triggering in seizures and other episodes should not be neglected, but rather taken seriously, sought and actively explored as a crucial element when taking clinical histories in patients with episodic attacks.

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### 1. Introduction

When people with epilepsy are asked about trigger factors for their seizures, their most common response is “stress” [1–3]. Neuroscience has approached the phenomenon of stress in a variety of ways, including the context of seizures and epilepsy [4–9]. Interesting data have been demonstrated in recent years from both human and experimental animal studies concerning correlations between epileptic activity and hormone levels, circadian rhythms, and developmental as well as behavioral aspects of stress [9–17]. However, stress is quite often thought to be an unspecific seizure-promoting stimulus and seems to be underappreciated in clinical practice [18]. In our experience, it is usual for an epileptic seizure in a context of stress to be classified as a psychogenic nonepileptic seizure (PNES), for example, or simply as a normal reaction to stress. Clinical evaluations by nonspecialists can be potentially problematic, if stress-triggered “fainting” is interpreted as a proof sign of nonepileptic pathophysiology.

Patient narratives are increasingly recognized as valuable in clinical practice and education [19–21]. We regard patient narratives of special value in epilepsy diagnosis and care [22,23]. We report ten illustrative

clinical histories from our work. Each patient story demonstrates a significant role of stress within the patient's experience of his/her seizure(s). The patient reports presented here are derived from their own words.<sup>1</sup> From these narratives we deduce that systematically exploring patients' accounts for trigger factors can be of great value [24]. Certain patterns emerge not only in the general context of epilepsy, but more specifically in distinct epilepsy syndromes. We will show the value of exploring the subjective meaning of “stress” repeatedly, and suggest that patients' attributions of a connection between seizures and stress is worth taking seriously.

### 2. Epileptic seizures and trigger factors

Seizures can be triggered (i.e., precipitated or provoked) by various types of external and internal stimuli [25]. In patients with epilepsy, triggered seizures (both single and multiple) can alter a formerly stable seizure frequency or represent a recurrence after a seizure-free period. A triggered seizure can also represent the initial event in a patient's epilepsy history, and some patients even develop disease courses with seizures occurring predominantly or exclusively after particular triggers. On the other hand, provoked seizures can also occur several times without reflecting epilepsy [26].

*Abbreviations:* IGE, idiopathic generalized epilepsy; JME, juvenile myoclonic epilepsy; PNES, psychogenic nonepileptic seizure.

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Typical seizure triggers are sleep deprivation, systemic infection, fever, critical phases of the menstrual cycle, intake or withdrawal of certain drugs and substances including alcohol, as well as homeostatic imbalances such as hyponatremia [26]. Flickering light is a classic trigger in selected scenarios, e.g., in photosensitive epilepsies. For patients on anticonvulsants, factors attenuating medication efficacy can act as a trigger, e.g., a pharmacological interaction or pharmacokinetic changes during pregnancy. Less common, specific sensory modalities can trigger seizures, such as in the reflex epilepsies. Examples of potential external sensory stimuli are: touch, hot water, specific visual patterns, reading, music, and even more complex triggers like thoughts and emotions have been reported [25].

The variety and omnipresence of all these factors makes it difficult to estimate the role of stress as a precipitating factor in individual patients. Moreover, “stress” is a superordinate, broad and sometimes vague concept encompassing many different kinds of taxing experience.

### 3. Patterns of relations between stress and seizures

#### 3.1. Sleep disruption

##### 3.1.1. Narrative 1

Although he had been seizure-free for several years, Richard, a tall strong man in his fifties, came for an appointment year after year. On each visit, he emphasized that these appointments were important

and helpful for him, in order “to hear that everything is okay”. He had achieved good control of his idiopathic generalized epilepsy (IGE) through a combination of medication (topiramate) and a very self-disciplined lifestyle. He avoided extremes of sleep deprivation, since he remembered his striking susceptibility to sleep deprivation from his adolescent years quite well. In addition, he avoided any alcohol consumption. Thus, his situation had been stable for a decade, although his routine electroencephalography (EEG) continued to display short paroxysms of spike wave activity (Fig. 1). Finding his name scheduled outside his regular cycle of visits therefore was a surprise. During the interview he seemed aggrieved: “I’ve made a mistake, Doc, it hit me again. I should have known better. Everything had been fine for more than 10 years now and I felt I had overcome it! So I allowed myself to relax this one time – what a mistake!”. He began to tell about a perfect ski holiday with family and friends, which he attended every winter. He had been careful to avoid alcohol and lack of sleep all through the years strictly. But this time, after the perfect last day, “I wanted to grant myself a little freedom” from the rigorous self-constraint. “So I enjoyed a very nice après-ski night, staying awake to the early morning with only a few drinks. It felt really happy, but I received the bill the next day”.

This is an instance of a seizure triggered by profound sleep deprivation in otherwise well-controlled IGE. While his story did not include stress as the leading factor, many patients report a similar scenario with a grand mal seizure when stress leads to a significant lack of sleep, most likely in an IGE. Some forms of epilepsy are very susceptible

Source; 5 $\mu$ V/mm; 0.3s; 35Hz

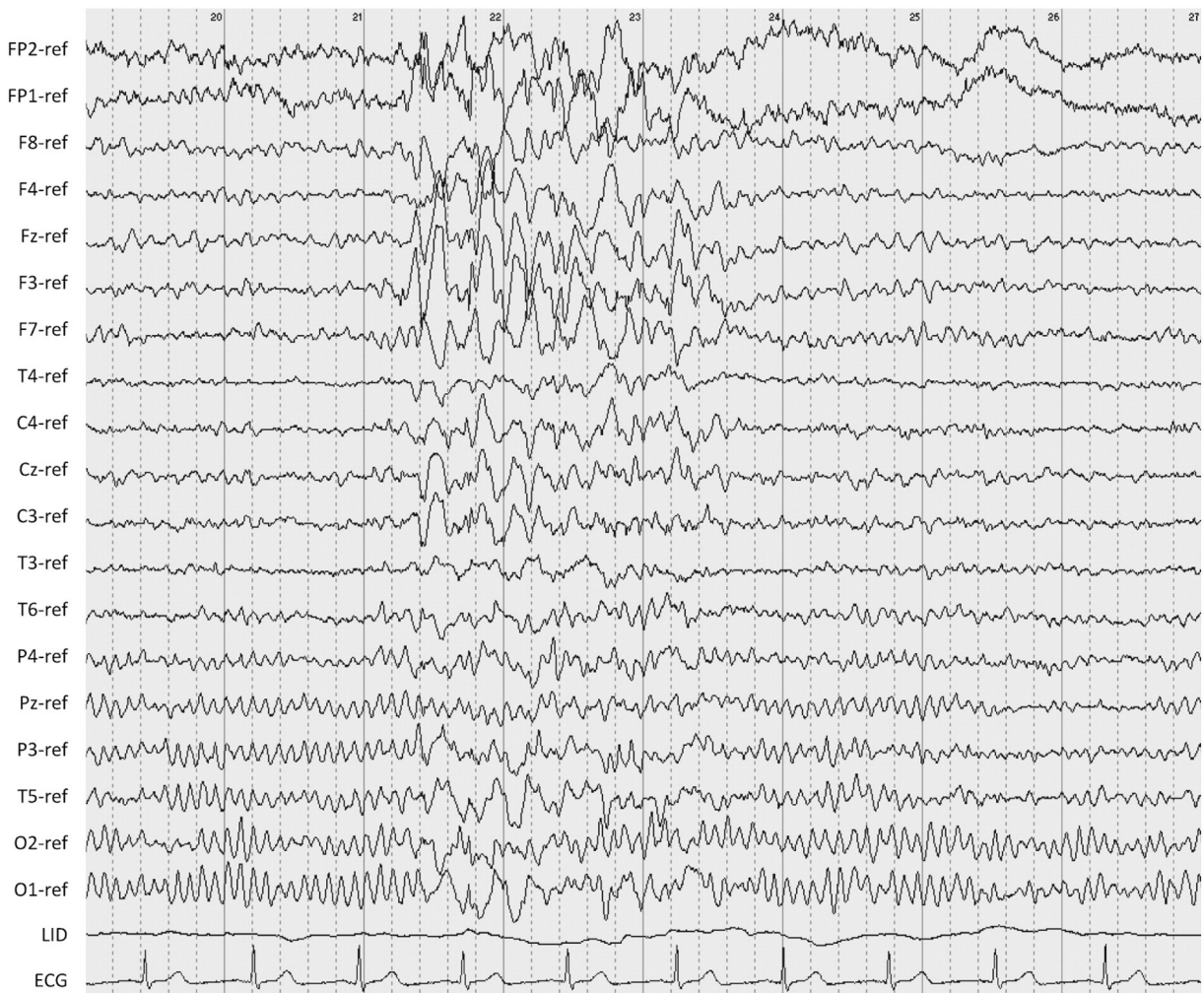


Fig. 1. (Narrative 1): Sample from Richard's typical interictal routine EEGs as obtained at most of his appointments during the seizure-free years.

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