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Difference in anxiety symptoms between children and their parents facing a first seizure or epilepsy

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ABSTRACT

Many studies have shown that anxiety disorders are common in children with epilepsy. We explored symptoms of anxiety simultaneously in children and their parents. We conducted a cross-sectional study using the Revised Children's Manifest Anxiety Scale in children and the State-Trait Anxiety Inventory for Adult in parents. We included 118 parents and 67 children, who were divided into three groups: (1) first seizure, (2) epilepsy, and (3) nonepileptic paroxysmal event. We found that the level of anxiety in parents and children differed. We observed a significant increase in the anxiety level of parents whose children have had a first seizure, while we found a significant increase in the anxiety level of children and adolescents followed for epilepsy. These findings suggest that there is no direct relationship in the anxiety of the parents and their child. Further studies are needed to understand this variation over time.

1. Introduction

Several studies have shown that behavioral disturbances are more common in children with epilepsy than in healthy controls. This is particularly true for depression and anxiety [1–6]. Schoenfeld et al. [4] showed the existence of internalizing disorders, particularly concerning a risk for depression or anxiety, in children with complex partial seizures. Comorbid psychiatric disorders are important to consider because they are associated with deleterious effects on social functioning and on quality of life [7,8]. The early assessment of psychosocial problems and appropriate interventions can, therefore, be beneficial for the child and family.

Investigators have reported a high prevalence of anxiety symptoms in children with epilepsy, although the number of studies that have examined this condition in children and adolescents is relatively small [1–5]. Anxiety has been attributed to the unpredictable nature of epilepsy, the lack of control of the seizure, the possibility of injury or embarrassment, and the fear of death [9,10]. Parental reactions to fear might also have an impact on child anxiety. Indeed, mothers of children with epilepsy show a higher level of anxiety compared with the general population, with associated effects on their quality of life and on their adjustment to the chronic disease of their child [7,8]. Most studies in the general child population demonstrate an association between anxiety in the parents and anxiety in their children [11,12]. It is, however, not clear whether anxiety observed in parents has an impact on the anxiety of their children with epilepsy.

While psychosocial aspects of epilepsy may contribute to anxiety symptoms, they could also be attributed to the pathophysiological process since seizures can modify neurobiological pathways that are involved in anxiety [13]. Both clinical evidence and experimental evidence suggest that brain inflammation and imbalances in neurotransmitters such as glutamate, gamma-aminobutyric acid (GABA), or serotonin, which are commonly observed in patients with epilepsy, are likely to contribute to the appearance of anxiety symptoms [13]. It has been reported that seizure frequency, epilepsy type, and duration of the disease are related to behavioral outcomes, although this is poorly documented in children [14,15]. In a recent study, Loney et al. investigated whether children presenting a first seizure experienced anxiety and depressive signs. The results indicate that anxiety is more closely related to the patient's medical signs or the hospital experience than to epilepsy itself [14].

To further understand the emergence of anxiety symptoms in children with epilepsy, the first aim of this study was to determine whether children presenting a first seizure exhibit anxiety according to the Revised Children's Manifest Anxiety Scale (RCMAS) and the second was to compare them with children who have experienced a nonepileptic paroxysmal event (NEPE) and those who have developed epilepsy. To better understand the relationship between parental anxiety and the occurrence of anxiety in our patients, we also assessed the parents

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using the State-Trait Anxiety Inventory for Adults (STAI) during their visit to our pediatric epilepsy unit. We hypothesize that a first seizure might be associated with a concomitant elevation in the level of anxiety in both the children and the parents.

2. Methods

2.1. Subjects

We conducted a prospective study from April 2010 to February 2012. The inclusion criteria were as follows: children between the ages of 6 and 16 years and children attending our epilepsy unit for epilepsy or for a possible first seizure. The exclusion criteria were as follows: patients with psychogenic seizures and patients with epileptic encephalopathy.

We included 67 patients (68% are males and 32% are females; age = 10.4 ± 3). These children were divided into three groups:

- Children who had experienced a first seizure ($n = 22$; age = 10.4 ± 3.1) (9 girls and 13 boys)
- Children with epilepsy ($n = 25$; age = 9.9 ± 2.6) (5 girls and 20 boys) (the main characteristics of our patients are reported in Table 1)
- Children who had experienced a NEPE who were evaluated in our first seizure clinic ($n = 20$; age = 11.2 ± 3.1) (8 girls and 12 boys). The patients with NEPEs were the children referred to our unit for a first seizure, but the final diagnosis was a paroxysmal event (e.g., syncope and orthostatic hypotension).

The groups were not significantly different when compared by age or by gender.

Furthermore, we included all parents of children attending our unit (118 parents; 75% are mothers and 25% are fathers). They were also divided into the same three groups:

- Parents of children who had experienced a first seizure ($n = 44$)
- Parents of children with epilepsy ($n = 47$)
- Parents of children who had experienced a NEPE and were evaluated in our first seizure clinic ($n = 27$).

Table 1
Main characteristics of the patients with epilepsy.

Patient	Epilepsy syndrome	Age (years)	Duration of disease (years)	Seizure frequency
1	Focal epilepsy (MRI normal)	11	4	1/month
2	Focal epilepsy (MRI normal)	8	3	Seizure-free
3	Focal epilepsy (white matter hypersignal)	8	2	Seizure-free
4	IGE	12	6	Seizure-free
5	Focal epilepsy (MRI normal)	7	1	Seizure-free
6	Focal epilepsy (MRI normal)	7	2	1/month
7	IGE	10	3	Seizure-free
8	IGE	8	1	1/year
9	Focal epilepsy (MRI normal)	15	1	Seizure-free
10	Focal epilepsy (MRI normal)	8	2	1/month
11	IGE	7	2	Seizure-free
12	Focal epilepsy (MRI normal)	11	1	3/year
13	Rolandic epilepsy	11	2	5/year
14	IGE	8	2	10/month
15	Focal epilepsy (MRI normal)	8	4	1/month
16	Focal epilepsy (MRI normal)	8	1	Seizure-free
17	Focal epilepsy (MRI normal)	14	1	Seizure-free
18	Focal epilepsy (MRI normal)	7	2	Seizure-free
19	Focal epilepsy (cortical dysplasia)	10	1	Seizure-free
20	Rolandic epilepsy	13	10	Seizure-free
21	Rolandic epilepsy	8	2	2–3/year
22	Rolandic epilepsy	9	1	Seizure-free
23	Focal epilepsy (MRI normal)	10	1	Seizure-free
24	Rolandic epilepsy	15	3	2/year
25	Focal epilepsy (MRI normal)	14	2	Seizure-free

IGE: idiopathic generalized epilepsy, MRI: magnetic resonance imaging.

According to age restriction for inclusion in the study, several parents were included without their child. Concerning included parents with their child, only six children had both parents included.

Since it has been suggested that anxiety in children who experienced a first seizure might be related to the illness as well as to the hospital experience itself [15], the inclusion of our group with NEPEs was intended to distinguish the role of the disease from the role of the hospital experience. We routinely conducted an anxiety evaluation in our unit for children with epilepsy and for children who have experienced a first seizure. Our first seizure evaluation was done on a daily basis outside the inpatient department. The evaluation of anxiety was done before the clinical evaluation and before the explanation of the diagnosis. An educational program for parents and children was also conducted in our unit, but this was performed only after the anxiety evaluation.

2.2. Measures

We used the RCMAS in children and the STAI in parents.

The RCMAS [16] is a self-report instrument measuring anxiety in children aged 6–19 years old and consists of 37 items, each of which requires a yes or a no answer. It generates a total anxiety t score (mean = 50 ± 10) as well as scaled scores on three anxiety subscales: (1) physiological anxiety, (2) worry/oversensitivity, and (3) social concerns (mean = 10 ± 3). A lie scale score is also obtained: a score above 13 implies an inaccurate self-report. The reliability and validity of this measure are well established [16]. It has established internal consistency and construct validity, and t scores ≥ 60 are considered clinically meaningful and suggestive of significant anxiety. For younger children or children with reading disabilities, the RCMAS was read to the child by the nurses (EG and MD) who were blinded to the diagnosis.

The STAI [17] is a 20-item questionnaire used to assess parental anxiety, measuring state and trait anxiety using two different forms. There are four possible responses to each statement, from “almost never” to “almost always,” describing how they feel at the moment for the state scale and how they generally feel for the trait scale. Scores range from 20 to 80. Higher scores are associated with increased anxiety. Mean scores for adults are 34.89 (SD = 9.2) for males and 34.79 (SD = 9.2) for females.

2.3. Statistics

Data were recorded anonymously. Percentages were rounded to whole numbers. We report the mean ± standard error of the mean (SEM) of continuous data. A t-test was performed using the GraphPad Prism 5 software (GraphPad Software Inc., San Diego, CA). We first compared the group with first seizures with the group with NEPEs. Then, we compared the group with first seizures with the group with epilepsy. Categorical variables were analyzed using either the chi-square test or Fisher's exact test (according to the sample size); $p < 0.05$ was considered statistically significant.

3. Results

3.1. Children

3.1.1. Comparison with the general population

In terms of the total anxiety score (physiological anxiety and social concerns), children with epilepsy obtained higher scores on the RCMAS compared with healthy children. In contrast, those in the group with first seizures and the group with NEPEs showed a normal level of anxiety (no significant difference with norms; t-test compared with published norm mean: 10.32; SD: 5.6; $n = 1355$[16]), with the exception of physiological anxiety in the group with NEPEs, which was higher than that in the general population ($p = 0.03$).