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ORIGINAL ARTICLE

Validation of the Azeri version of the Pediatric Epilepsy Side Effects Questionnaire

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Abstract

Purpose Long-lasting use of antiepileptic drugs in children with epilepsy negatively influences their quality of life and compliance. The purpose of this study was validation of the Azeri version of the Pediatric Epilepsy Side Effects Questionnaire (PESQ).
Methods We collected the PESQ from caregivers of children with epilepsy. In order to screen for comorbid behavioral and emotional problems, the Strengths and Difficulties Questionnaire (SDQ) was used. Demographic and medical data were collected through patient charts. We conducted factor analysis and assessed internal consistency and construct validity of the PESQ.
Results Caregivers of 120 patients with different epileptic syndromes completed the PESQ (age range 2–18; mean age 9.8 ± 4.0; male 56.7%; polytherapy 24%). The factor loading in the principal component analysis confirmed five-factor structure of the PESQ. The internal consistency coefficient of the total side effects scale of the PESQ was strong (0.86). Children receiving polytherapy showed higher scores on all subscales and the total score of the PESQ, supporting its construct validity. The total scores of the PESQ and the SDQ strongly correlated.
Conclusions The PESQ can be used as a reliable and valid measure assessing antiepileptic drug side effects across the epilepsy spectrum.

Keywords Epilepsy · Pediatric Epilepsy Side Effects Questionnaire · Strengths and Difficulties Questionnaire

Introduction

Most of the children with epilepsy are subjects for long-lasting use of antiepileptic drugs (AED) in order to optimize seizure control. AED side effects negatively influence quality of life and compliance [1, 2]. In order to establish the minimal effective dose, the AED are titrated up until clinical response is achieved or the level of drug toxicity is reached. Monitoring for side effects during titration of AED and thereafter is a crucial part of epilepsy treatment.

The Pediatric Epilepsy Side Effects Questionnaire (PESQ) is a measure of AED side effects that is brief and easy to administer. The PESQ has good psychometric characteristics [3]. It has been used for clinical research purposes [1, 4, 5]. The PESQ results can provide clinicians with information that may influence their clinical decisions [6].

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In order to investigate the effectiveness of the Azeri version of the PESQ, we administered the PESQ to a group of children with epilepsy. This is the first study evaluating a screening measure for drug side effects in the child and adolescent population in Azerbaijan.

Methods

Subjects

We collected the PESQ consequently from 120 epilepsy patients referred to Medina Medical Center, a primary care facility for children with neurological and psychiatric disorders as well as for general pediatric patients. The PESQ were filled in by the parents of the patients. Medina Medical Center serves children of all levels of socioeconomic status, and most of the referred patients are residents of Baku city. Table 1 shows demographics and clinical characteristics of the epilepsy patients.

The difference between boy and girl groups was insignificant in age ($t = -1.333$, df = 133, $p = 0.894$).

Table 1 Demographics and clinical characteristics of the epilepsy patients

Demographics	
Age range	2–18
Mean age	9.8 ± 4.0
Boys	68 (56.7%)
AED	
Monotherapy	91
CBZ	31
VPA	45
TPM	5
LEV	5
PHB	4
ETS	1
Polytherapy	29
CBZ	19
VPA	21
TPM	5
LEV	4
PHB	8
CLZ	4
LMT	4
Etiology	
Idiopathic focal	21
Idiopathic generalized	16
Symptomatic	19
Unknown	64

Behavioral and emotional problems of the children and adolescents were rated with the Azeri version of the Strengths and Difficulties Questionnaire (SDQ). We collected the parent version of the SDQ consequently from all outpatients aged 4–16 years old referred to Medina Medical Center. The SDQ were presented to the parents and completed by them, before they actually met the doctor.

The Azeri version of the PESQ

The original PESQ version was translated into Azeri by a group of researchers. The PESQ measure consists of 19 items [3]. The items are divided into 5 subscales: cognitive (6 items), motor (4 items), behavioral (3 items), general neurological (4 items), and weight (2 items) side effects. Each item is rated on a 6-point scale. The summary score or total side effect scale is made up from 5 subscales.

The Azeri version of the SDQ

The original SDQ version for 4–17 year olds was translated into Azeri by a group of researchers, and the back-translation of the Azeri version was compared to the original questionnaire and revised by the SDQ's author [7, 8]. All versions of the SDQ are available free of charge (http://www.sdqinfo.com). The SDQ measure consists of 25 items. The items are divided into five subscales, each of which explores a different area of skill or difficulty: four subscales refer to difficulties (hyperactivity/inattention, emotional symptoms, peer relationship problems, and conduct problems) and one to strengths (prosocial behavior). Each subscale consists of 5 items. Each item is rated on a 3-point scale. The SDQ total score is obtained by summing the scores of difficulty subscale items.

Statistical analysis

The data of the total side effects scale, the five side effect subscales of the PESQ, were analyzed. Statistical analyses were performed using SPSS (version 19.0, Chicago, IL, USA).

In order to determine whether an original five-factor structure is preserved in the Azeri version of the PESQ, we performed exploratory factor analysis using principal component analysis with varimax rotation. Internal consistency coefficient was calculated for the total side effect scale of the PESQ. We calculated Pearson product moment correlation coefficients to determine the relationship between number of AEDs and side effect scale scores.

Pearson product moment correlation coefficients between total scores and the subscale scores of the PESQ and the SDQ were calculated.

Results

Factor analysis

The factor loading in the principal component analysis confirmed the five-factor structure of the Azeri version of the PESQ (Table 2). The internal consistency coefficient of the total side effects scale of the PESQ was strong (Cronbach α = 0.855).

Number of AED

Children receiving more than one AED (polytherapy) showed higher scores on all side effect subscales and the total score of the PESQ. The difference reached a statistical significance for the total score and two subscales (Table 3). The difference between patients receiving monotherapy and polytherapy was insignificant in terms of age ($t = 0.457$; df = 143; p = 0.649).

Table 2 The PESQ: factor loading

	1	2	3	4	5
Cognitive					
1. Slow thinking	0.737	0.360	0.221	0.092	0.048
2. Memory problems	0.840	0.056	0.082	0.102	0.051
3. Confusion	0.835	0.068	− 0.001	0.229	0.125
4. Poor school results	0.677	0.348	0.185	− 0.130	− 0.072
5. Decreased concentration	0.867	0.069	0.193	0.098	0.071
6. Attention difficulties	0.585	− 0.105	0.279	− 0.027	0.262
Motor					
7. Unstable walking	0.351	0.061	0.718	0.006	0.129
8. Poor coordination, clumsiness	0.268	− 0.202	0.647	0.134	0.342
9. Falling (not seizure)	− 0.016	0.174	0.864	0.149	− 0.083
10. Speech difficulties	0.215	0.179	0.432	0.271	− 0.010
Behavior					
11. Aggression	− 0.004	0.063	0.115	0.870	0.050
12. Hyperactivity	0.080	− 0.002	0.077	0.853	0.119
13. Personality change	0.266	0.185	0.216	0.468	0.167
Neurological					
14. Drowsiness, sleepiness	0.004	0.705	0.013	− 0.027	0.270
15. Fatigue, tiredness	0.072	0.695	− 0.010	0.059	0.225
16. Dizziness, lightheadedness	0.118	0.729	0.208	0.069	− 0.079
17. Headaches	0.326	0.575	− 0.003	0.180	− 0.175
Weight					
18. Increase in appetite	0.117	0.105	0.104	0.137	0.854
19. Weight gain	0.097	0.141	0.035	0.113	0.837

The PESQ and the SDQ

The total scores of the PESQ (mean = 12.8; standard deviations = 12.9; range = 58.9) and the SDQ (mean = 15.1; standard deviations = 6.43; range = 33) strongly correlated. The total score of the PESQ positively correlated with all problem subscales and negatively correlated with prosocial behavior subscale of the SDQ (Table 4).

Discussion

In this study, we investigated the psychometric value of the Azeri version of the PESQ. The Azeri version of PESQ showed good psychometric properties, including good internal consistency and construct validity.

AED treatment aims at controlling seizures without inducing side effects. Parents express worries about potential

Table 3 Number of AED and the PESQ scores

The PESQ scores	Monotherapy ($n = 91$)	Polytherapy ($n = 29$)	Independent sample test				
			t	df	p	MD	95% CI
Cognitive	14.8 ± 21.3	22.2 ± 27.2	− 1.516	118	0.132	− 7.4 ± 4.9	− 17.1 ± 2.3
Motor	6.9 ± 12.4	13.7 ± 17.8	− 2.301	118	0.023	− 6.8 ± 3.0	− 12.6 ± − 0.9
Behavioral	10.7 ± 17.9	24.2 ± 24.0	− 3.238	118	0.002	− 13.5 ± 4.2	− 21.7 ± − 5.2
General Neurological	11.5 ± 13.8	13.6 ± 16.7	− 0.696	118	0.488	− 2.2 ± 3.1	− 8.3 ± 4.0
Weight	11.0 ± 22.3	12.4 ± 17.7	− 0.314	118	0.754	− 1.4 ± 4.6	− 10.4 ± 7.6
Total	11.3 ± 12.1	17.4 ± 14.5	− 2.244	118	0.027	− 6.1 ± 2.7	− 11.5 ± − 0.7

MD mean difference, *CI* confidence interval

Table 4 The PESQ and the SDQ correlation

	The PESQ Total score
The SDQ	
Total score	0.558*
Emotional symptoms	0.502*
Hyperactivity/inattention	0.437*
Peer relationship problems	0.428*
Conduct problems	0.205
Prosocial behavior	− 0.387*

Data presented in italics indicate moderate to large strength of association

*Pearson correlation is significant at the 0.01 level (2-tailed)

negative side effects of AED on cognition, behavior, mood, and academic achievement [9]. Side effects of AEDs have negative influence on quality of life and may lead to poor compliance. The PESQ consists of five subscales, including cognitive, motor, behavioral, general neurological, and weight, corresponding to the most common side effects of AEDs [10]. The Azeri version of the PESQ showed good internal consistency. The factor analysis of the Azeri version confirmed the five-subscale structure of the original version of PESQ (Table 2).

Polytherapy is associated with more side effects than monotherapy [10]. In a study by Morita et al., the PESQ detected more cognitive, motor, behavioral, and general neurological side effects as the number of AEDs increased [3]. In our study, children on polytherapy had higher PESQ scores on all subscales and the difference received statistical significance for motor subscale, behavior subscale, and the total score. Dash et al. showed that optimization of reduction of the number of AEDs in patients with drug-resistant epilepsy leads to reduction or no change in seizure frequency with a significant decrease in adverse effects [11]. Therefore, the PESQ may be a useful tool in the long-term management of pediatric epilepsy patients, particularly in the process of deciding on an optimal dosage of AEDs.

The total score of the PESQ was significantly correlated with the total score of the SDQ. The total score of the PESQ also correlated with difficulty subscales of the SDQ. The correlation did not reach a level of significance for conduct problem subscale of the SDQ, which may be related to relatively heterogeneous symptoms in this subscale. The total score of the PESQ showed negative correlation with prosocial behavior subscale of the SDQ (the strength subscale). Higher levels of side effects reflected by higher PESQ scores may limit social opportunities of the children with epilepsy. The prevalence of psychiatric symptoms is higher in symptomatic epilepsy as compared to idiopathic epilepsy, suggesting the severity of epilepsy as a possible cofounder [12]. On the other hand, the more severe is epilepsy the more chances are that patient will have polytherapy, which is correlated with higher scores of the PESQ.

This study has several limitations. The PESQ monitors only the most frequent side effects of the AED, while many other symptoms are not included. Therefore, it was recommended to use the questionnaire in conjunction with clinical interview and other medical information [3]. Another limitation is the absence of cutoff values for making decision on AED regimen based on the PESQ scores.

The sample of children with epilepsy was diverse in terms of epilepsy type, age, number, and type of AEDs used. Thus, the Azeri version of the PESQ can be used as a reliable and valid measure assessing AED side effects in research and clinical practice across the epilepsy spectrum.

Compliance with ethical standards

The study was approved by the Ethics Commission of Azerbaijan Psychiatric Association.

Conflict of interest On behalf of all authors, the corresponding author states that there is no conflict of interest.

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