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Validation of the Hospital Anxiety and Depression Scale in patients with epilepsy

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ABSTRACT

Objective: Despite the fact that depressive disorders are the most common comorbidities among patients with epilepsy (PWEs), they often go unrecognized and untreated. The availability of validated screening instruments to detect depression in PWEs is limited. The aim of the present study was to validate the Hospital Anxiety and Depression Scale (HADS) in adult PWEs.
Methods:: A consecutive group of 118 outpatient PWEs was invited to participate in the study. Ninety-six patients met inclusion criteria, completed HADS, and were examined by a trained psychiatrist using Structured Clinical Interview (SCID-I) for DSM-IV-TR. Receiver operating characteristic (ROC) curves were used to determine the optimal threshold scores for the HADS depression subscale (HADS-D).
Results: Receiver operating characteristic analyses showed areas under the curve at approximately 84%. For diagnoses of MDD, the HADS-D demonstrated the best psychometric properties for a cutoff score ≥7 with sensitivity of 90.5%, specificity of 70.7%, positive predictive value of 46.3%, and negative predictive value of 96.4%. In the case of the group with 'any depressive disorder', the HADS-D optimum cutoff score was ≥6 with sensitivity of 82.5%, specificity of 73.2%, positive predictive value of 68.8%, and negative predictive value of 85.4%.
Conclusions: The HADS-D proved to be a valid and reliable psychometric instrument in terms of screening for depressive disorders in PWEs. In the epilepsy setting, HADS-D maintains adequate sensitivity, acceptable specificity, and high NPV but low PPV for diagnosing MDD with an optimum cutoff score ≥7.

1. Introduction

Depressive disorders are the most common psychiatric comorbidities in patients with epilepsy (PWEs). The detection of depression is of particular clinical importance in PWEs as, despite extensive data on its occurrence, it is often still underdiagnosed and untreated. A key reason for this is the lack of well-validated, self-report, screening psychometric instruments in PWEs which could be easily implemented in a clinical setting.

Reliable screening instruments for depression are crucial in PWEs especially since antiepileptic drug (AED) side effects as well as periictal symptomatology might affect the accuracy of psychiatric diagnosis in epilepsy [1]. When choosing a psychometric instrument for screening purposes, it is important to optimize cutoff points for the population with epilepsy [2–4]. At the moment, there is only a limited number of validation studies concerning screening instruments for depression in epilepsy. In some studies, self-report scales, already used in the general population and in other medical illnesses, were validated for use in PWEs, namely the Beck Depression Inventory (BDI) [5,6] and the Hospital Anxiety and Depression Scale (HADS) [2,5–10]. Recently, a new six-item screening instrument, the Neurological Disorders Depression Inventory for Epilepsy (NDDI-E), was developed specifically for use in PWEs [10–14]. This instrument was designed to minimize the potential for confounding factors related to AEDs or epilepsy itself.

Similarly, HADS is the scale that has no items relating to somatic symptoms that may confound the diagnosis in PWEs and therefore reduce the sensitivity in screening for depression. It was developed in the early 1980s as a tool to identify anxiety and depressive disorders in nonpsychiatric patients within a hospital setting [15,16] and was broadly used in the general population and in many populations with different somatic illnesses. There were only a few validation studies in PWEs, with some confounding results [2,7,8].

The aim of this study was to validate the psychometric properties of the HADS depression subscale in PWEs in order to find optimal specificity, sensitivity, and cutoff scores for identifying depressive disorders.

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2. Methods

2.1. Study sample

The study population selection and psychometric evaluation has been described in detail elsewhere [17]. Briefly, over a 1-year period, a consecutive series of 118 PWEs from a regional epilepsy outpatient unit was screened for the study, with 96 patients meeting inclusion/exclusion criteria and enrolled. All individuals underwent a complete neurological examination at study entry. Inclusion criteria were as follows: (1) confirmed diagnosis of active epilepsy according to the International League Against Epilepsy criteria (ILAE) [18] by a trained epileptologist, (2) aged 18–65 years, (3) stable antiepileptic treatment in the last 2 months, and (4) willing to provide a written informed consent to undergo the experimental procedures. Exclusion criteria included (1) neurologic somatic-related factors: last seizure within 24 h prior to examination, more than 10 seizures in the last month, major brain damage with mass effect, neurosurgical treatment of epilepsy, unstable somatic disease or serous neurological disorder, psychogenic nonepileptic seizures and (2) psychiatry-related factors: mental retardation, dependence on or abuse of alcohol and/or other drugs in the past 6 months, and diagnosis of borderline, antisocial, or schizotypical personality disorder.

The study protocol was approved by the local bioethics committee at the Medical University of Gdańsk. All participants provided written informed consent for participation in the study.

2.2. Instruments

All subjects were assessed using Structured Clinical Interview (SCID-I) [19] and HADS at the same visit by the same psychiatrist (MSW). Structured Clinical Interview is a semistructured interview used for the identification of DSM-IV-TR psychiatric disorders [19].

The Hospital Anxiety and Depression Scale (HADS) was developed by Zigmond and Snaith in 1983 [15,16] to identify caseness (possible and probable) of anxiety disorders and depression among patients in nonpsychiatric hospital clinics. The tool includes 14 items, seven related to anxiety (HADS-A) and seven related to depression (HADS-D), each scored between 0 and 3. The scale authors recommended that a score >8 on an individual scale should be regarded as a possible case. This threshold was found to be optimal for HADS-A and HADS-D in the general population as well as in samples of patients with somatic symptoms.

For analyses, patients were assigned either to a diagnostic group, 'major depressive disorder', or to a comprehensive group, 'any depressive disorder'. The group with 'any depressive disorder' was comprised of MDD and mood disorders with depressive features that do not meet the criteria for major depressive disorder (depressive disorder not otherwise specified [DD-NOS]: minor depression, recurrent brief depressive disorder, dysthymic disorder, mood disorder due to a general medical condition, substance-induced mood disorder).

2.3. Statistics

In order to determine the diagnostic sensitivity and specificity of the HADS for the DSM-IV depressive disorder diagnoses and determine an optimal cutoff point, a receiver operator characteristic (ROC) curve was obtained for HADS-D.

Area under the curve (AUC) values were interpreted according to the following guidelines: 0.9–1, excellent; 0.8–0.9, good; 0.7–0.8, fair; and 0.6–0.7, poor. Cutoff values were established with the (0, 1) minimum distance method giving equal weight to sensitivity and specificity. There were no missing data or outliers.

Frequencies and descriptive statistics were analyzed for each variable. Comparisons between patients with current MDD and patients without MDD were made using Student's t-tests for normally distributed continuous data, Mann–Whitney's U-test for nonnormally distributed data, and Fisher's exact test for categorical data. A value of $p < 0.05$ was considered to be statistically significant. Statistical procedures were performed using Statistica 10.0.1011.

Table 1
Demographic and clinical characteristics of study total population.

	N = 96 (%)
Male sex (%)[a]	31 (32.3)
Age, in years (SD)[b]	36.6 (12.0)
Age of seizure onset (SD)	19.5 (11.6)
	17.0 (11.8)
Duration of epilepsy (SD)	3 (2.5)
Number of seizures/last month — median (IQR)	
Seizure type (%)	
Generalized	15 (15.6)
Simple partial	7 (7.3)
Complex partial	27 (28.1)
Partial evolving to general	47 (49.0)
Tonic–clonic	10 (10.4)
Absence	2 (1.0)
Myoclonic	1 (1.0)
Atonic	2 (2.1)
Number of AEDs (IQR)	2 (1.2)
Drug-resistant (%)	70 (72.9)
Polytherapy (%)	46 (47.9)

[a] Student's t-test.
[b] Fisher's exact test.

3. Results

Clinical and demographic characteristics are shown in Table 1. According to the SCID-I, the diagnosis of major depressive disorder (current episode) was established in 21 (22%) patients; 'any depressive disorder' was found in 40 (41.6%) patients. Mean HADS-D total scores for study groups are shown in Table 2.

Receiver operator characteristic values for the HADS-D are shown in Table 3. For diagnoses of MDD, the HADS-D demonstrated the best psychometric properties for a cutoff score of 6 with sensitivity of 90.5%, specificity of 70.7%, AUC of 84.9% (Fig. 1), positive predictive value of 46.3%, and negative predictive value of 96.4% (Table 4). In the case of the group with 'any depressive disorder', the HADS-D showed the best cutoff score of 5 with sensitivity of 82.5%, specificity of 73.2%, AUC of 83% (Fig. 1), positive predictive value of 68.8%, and negative predictive value of 85.4% (Table 4).

4. Discussion

The clinical profile of the study group is similar to other studies performed in specialized centers for epilepsy treatment (Table 5). In order to produce valid diagnoses, we used the complete version of SCID-I as a gold standard in psychiatric research. As previously observed, we found a high frequency of major depression (22%) and other forms of depressive disorders in PWEs [17].

A good screening method for the diagnosis of major depression must be practical and reliable, exhibiting an adequate balance between sensitivity and specificity. In the study group, the HADS-D showed significant ability as a screening tool for indicating depressive disorder categories in PWEs using ROC as compared with SCID-I. For major depression

Table 2
Psychometric characteristic of analyzed group.

Rating scale	Diagnostic category	(+) Median (IQR)	(−) Median (IQR)	Mann–Whitney Z	p	Difference (95% CI)
HADS-D	MDD	9 (7; 11)	4 (1; 6)	4.889	<0.0001	5 (4; 7)
	Any depressive disorder	8 (5; 10)	2 (1; 5)	5.541	<0.0001	5 (4; 6)