

Factors associated with hopelessness in epileptic patients

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Abstract

AIM: To investigate factors related to hopelessness in a sample of epileptic patients, including measures of depression and quality of life (QOL).

METHODS: Sixty-nine participants were administered the following psychometric instruments: Beck Depression Inventory-II, Beck Hopelessness Scale (BHS), and QOL

in Epilepsy (QOLIE)-89. Patients were dichotomized into two categories: those affected by epilepsy with generalized tonic-clonic seizures *vs* those having epilepsy with partial seizures.

RESULTS: The groups differed on the QOLIE Role Limitation/Emotional dimension. Patients with generalized seizures reported more limitations in common social/role activities related to emotional problems than patients with other types of epilepsy (89.57 ± 25.49 *vs* 72.86 ± 36.38 ; $t_{63} = -2.16$; $P < 0.05$). All of the respondents reported moderate to severe depression, and 21.7% of patients with generalized seizures and 28.6% of patients with other diagnoses had BHS total scores ≥ 9 indicating a higher suicidal risk. The study did not control for years of the illness.

CONCLUSION: Patients with generalized seizures reported more limitations in common social/role activities related to emotional problems compared to patients with other types of seizures. Patients at increased suicide risk as evaluated by the BHS were older than those who had a lower suicidal risk. Future studies are required to further investigate the impact of hopelessness on the outcome of epileptic patients.

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Key words: Epilepsy; Hopelessness; Suicide risk; Emotional problems; Social/role activities

Core tip: The present study assessed factors associated with hopelessness, depression, and quality of life in a sample of 69 epileptic patients using standardized psychometric instruments. All of the participants reported moderate to severe depression, and 25% of the patients had Beck Hopelessness Scale total scores ≥ 9 indicating a higher suicidal risk. Although the study did not control for years of the illness which may limit the generalizability of findings, patients with generalized seizures experienced more limitations

in common social/role activities due to emotional problems than those with other types of seizures.

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INTRODUCTION

Epilepsy is associated with a substantial economic burden, significant mortality and a dramatic decline in work productivity^[1]. Epilepsy affects approximately 3 million people in the United States, with 140000 new cases^[2,3] diagnosed every year. In European countries, epilepsy affects approximately 0.9 million children and adolescents (estimated prevalence: 4.75 per 1000) with 1.9 million cases reported in Europeans aged 20-64 years (estimated prevalence: 6 per 1000) and 0.6 million in those with 65 years and higher (estimated prevalence: 7 per 1000)^[4]. A recent report in Europe^[5] calculated an estimated 2.6 million individuals affected by epilepsy, costing 13.8 billion Euros in the year 2010.

Several studies have suggested that epilepsy is a severely disabling brain condition. Ding *et al*^[6] calculated the Years Lived with Disability (YLD) according to a prevalence survey of epilepsy in 66393 individuals recruited in rural Chinese provinces and epilepsy mortality data. Epilepsy accounted for 1.41 lost years of life and 0.67 YLDs per 1000 in the population. The population of rural China, therefore, lost 2.08 per 1000 Disability Adjusted Life Years related to epilepsy. Leonardi *et al*^[7] argued that the global burden of epilepsy should be recognized as a fundamental public health need since epilepsy was responsible for approximately 0.5% in terms of the global diseases burden worldwide in the year 2000.

One third of individuals with epilepsy have more than one seizure per month, and a satisfactory control of seizures is achieved in no more than 65%-70% of cases. Individuals who report being "seizure free" are usually those without medical and psychiatric comorbidities^[4] and/or with a high quality of life (QOL)^[8,9]. One of the most relevant challenges for clinicians is improving the QOL in epileptic patients. In the effort to reduce the subjective burden of this disorder and the associated psychosocial impairment, most of research has focused on patients suffering from refractory seizures^[10-14]. QOL and its predictors among patients with different types of epilepsy have been widely analyzed only by a few studies.

Several biological and psychosocial variables may influence QOL and subjective well-being. It has been suggested that hopelessness is closely related to depression, and hopelessness has been frequently reported in studies as strongly associated with suicidal behaviors^[15-17] as well as with medical illnesses, particularly terminal cancer^[18-21].

Table 1 Sociodemographic characteristics of the sample (n = 69)

	n (%)
Men	44.9%
Age (mean ± SD)	38.86 ± 15.99
Epilepsy	
Generalized seizures	35.4%
Partial seizures	64.6%

Hopelessness predisposes patients with psychiatric disorders to suicidal behavior and has been identified as a relevant risk factor for suicide, particularly in individuals with serious mental disorders^[16,22-24]. The QOL may be significantly altered by hopelessness and negatively influenced by poor psychosocial adjustment^[25-27], resulting in increased suicidal risk. Therefore, hopelessness represents a critical risk factor and may be predictive of perceived lower QOL^[28-30].

Attitudes toward epilepsy and self-efficacy have been found to be independent predictors of depressive symptoms. However, it has been suggested that the reduced self-efficacy related to seizure management may not influence the association between attitudes towards epileptic patients and depressive symptoms^[31]. As previous studies reported that hopelessness is a predictor of future suicide behaviors in patients with mood disorders^[32,33] and poor QOL^[34,35] in epileptic patients, the present study was designed to evaluate the role of risk factors associated with hopelessness on the QOL in a sample of epileptic patients.

MATERIALS AND METHODS

Participants

Individuals were volunteers for the study and provided written informed consent. The hospital's Institutional Review Board approved the study. Sixty-nine consecutive patients with epilepsy (31 men and 38 women) were admitted to the Department of Neurological Science, Neurological Unit, Sant'Andrea Hospital of Rome (Italy) between January 2010 and December 2010. The main socio-demographic and clinical characteristics of the sample are summarized in Table 1. The mean age of participants was 38.86 ± 15.99 years (36.65 ± 16.25 for men and 40.66 ± 15.76 for women; $t_{67} = 1.04$; $P = 0.30$). The majority of the patients was affected by partial seizures (64.6%) while 35.4% of them suffered from generalized tonic-clonic seizures.

Patients had to meet the following inclusion criteria: (1) they had a clinically established diagnosis of epilepsy with generalized tonic-clonic or partial seizures; (2) they were admitted consecutively as outpatients over a 12-mo period at the Department of Neurological Science, Neurological Unit, Sant'Andrea Hospital of Rome (Italy); (3) they were older than 18 years of age; and (4) they gave signed voluntary consent to participate in the research.

Exclusion criteria were: (1) a diagnosis of dementia or delirium; (2) positive psychotic symptoms (delusions

and hallucinations); (3) illiteracy or inability to perform the evaluation; and (4) an inability to provide informed consent.

Measures

The patients were administered the Beck Depression Inventory- II (BDI- II), the Beck Hopelessness Scale (BHS), and the QOL in Epilepsy Inventory-89 (QOLIE-89).

BDI- II: The BDI- II is a 21-item self-report instrument evaluating the presence/severity of depressive symptoms during the previous 14 d^[36]. Each item is scored from 0 to 3 in order to evaluate symptom severity, with total scores ranging from a 0 to 63. A score of ≥ 14 is suggestive of mild depression, while a score of ≥ 20 is suggestive of moderate to severe depression. Internal consistency and concurrent validity have been documented in clinical/non-clinical samples^[23,37].

BHS: The BHS is a 20-item self-report scale assessing hopelessness/negative attitudes concerning coming events^[15]. The scale evaluates feelings about the future, loss of motivation, and expectations for the future. Subjects are requested to endorse a pessimistic sentence or deny an optimistic sentence. Research has documented an association between the BHS total score and depressive symptoms, suicidal intent, and suicidal ideation. Furthermore, Beck *et al.*^[37] conducted a follow-up study on 1958 outpatients and reported that those with higher BHS total scores (≥ 9) were 11 times more likely to complete suicide than the outpatients with lower BHS total scores. Thus the BHS seems to be a useful predictor of eventual suicidal behavior. An Italian version of the BHS has been validated by Pompili *et al.*^[37]. The present study used the cutoff score of ≥ 9 to distinguish those patients at high risk for suicide.

QOLIE-89: The QOLIE-89 was developed based on the Epilepsy Surgery Inventory-55 and the Medical Outcomes Health Survey Short Form-36. It has 89 items assessing the following 17 dimensions of Health Related QOL (HRQOL): Health Perceptions, Overall QOL, Physical Functions, Role Limitations due to Physical Problems, Role Limitations due to Emotional Problems, Pain, Work/Driving/Social Functions, Energy/Fatigue, Emotional Well-Being, Attention/Concentration, Health Discouragement, Seizure Worry, Memory, Language, Medication Effects, Social Support, and Social Isolation. There are three additional items concerning sexual relations, changes in health, and overall health. Each subscale score was converted into a scale of 0-100 points, with higher scores indicative of a better level of functioning and higher QOL^[38,39].

Statistical analysis

Statistical analyses were carried out with SPSS 17.0 for Windows. Differences between the groups of patients with different severity of hopelessness and different diagnoses were evaluated using t-tests for dimensional

variables and one-way Fisher exact tests for 2×2 contingency tables. Significant variables at the bivariate analyses were then included in a logistic regression model as potential predictors. The groups of patients with different levels of hopelessness were included in the analysis as the dependent variable. The associations between variables are described as OR with confidence intervals and significance levels.

RESULTS

Differences between diagnostic groups

Table 2 presents the differences between those patients with generalized seizures *vs* those patients with partial seizures (including those who had secondarily generalized seizures). The two groups differed only on the QOLIE Role Limitation/Emotional dimension. Patients with generalized seizures reported more limitations in common social/role activities related to emotional problems as compared to patients with other diagnoses (89.57 ± 25.49 *vs* 72.86 ± 36.38 ; $t_{63} = -2.16$; $P < 0.05$). All of the respondents reported moderate to severe depression, and more than 20% (21.7% and 28.6%, respectively for patients with generalized seizures and patients with partial seizures) reported scores on the BHS ≥ 9 , indicating a higher suicide risk.

Differences between high-risk group vs low-risk group

On the BHS, 28.6% of the patients with partial seizures and 21.7% of those generalized seizures had a score ≥ 9 . Differences between the two groups of patients were categorized by hopelessness severity (*i.e.*, high *vs* low BHS total scores) are presented in Table 3. Patients with high BHS: (1) were older (50.53 ± 15.36 *vs* 35.04 ± 14.37 ; $t_{67} = -3.80$; $P < 0.001$); (2) reported more severe depressive symptoms on the BDI- II (38.24 ± 8.53 *vs* 27.46 ± 5.88 ; $t_{67} = -4.84$; $P < 0.001$); (3) had lower scores on the QOLIE Health Perception subscale (55.64 ± 20.14 *vs* 72.52 ± 18.93 ; $t_{67} = 3.14$; $P < 0.01$); (4) had lower scores on the Overall QOL (54.85 ± 14.10 *vs* 70.25 ± 17.03 ; $t_{67} = 3.69$; $P < 0.001$); (5) had lower scores on the Role Limitation Physical subscale (57.65 ± 37.34 *vs* 78.08 ± 31.25 ; $t_{67} = 2.23$; $P < 0.05$); (6) had lower scores on the Role Limitation Emotional subscale (52.94 ± 39.96 *vs* 86.92 ± 26.83 ; $t_{67} = 3.27$; $P < 0.01$); (7) had lower scores on the Pain subscale (64.56 ± 31.24 *vs* 81.88 ± 22.92 ; $t_{67} = 2.46$; $P < 0.05$); (8) had lower scores on the Energy/Fatigue subscale (48.53 ± 21.05 *vs* 66.22 ± 20.13 ; $t_{67} = 3.11$; $P < 0.01$); (9) had lower scores on the Emotional Wellbeing subscale (49.41 ± 18.27 *vs* 73.08 ± 17.64 ; $t_{67} = 4.76$; $P < 0.001$); (10) had lower scores on the Memory subscale (55.08 ± 26.84 *vs* 71.43 ± 25.39 ; $t_{67} = 2.27$; $P < 0.05$); (11) had lower scores on the Social Isolation subscale (71.18 ± 27.59 *vs* 88.65 ± 17.60 ; $t_{67} = 2.45$; $P < 0.05$); (12) had lower scores on the Changes in Health subscale (48.53 ± 25.72 *vs* 67.31 ± 27.36 ; $t_{67} = 2.49$; $P < 0.05$); and (13) had lower scores on the Overall Health subscale (55.63 ± 15.04 *vs* 72.50 ± 19.29 ; $t_{67} = 3.21$; $P < 0.01$).

Table 2 Differences between diagnostic groups (generalized seizures *vs* partial seizures)

		Mean	SD	t-tests (DF: 67)	Significance
Age	Partial seizures	40.81	15.09	1.06	0.30
	Generalized seizures	36.35	18.35		
Men (%)	Partial seizures	35.7%	-		0.09
	Generalized seizures	56.5%	-		
BHS	Partial seizures	6.86	4.05	1.27	0.21
	Generalized seizures	5.52	4.04		
BHS ≥ 9	Partial seizures	28.6%	-	-	-
	Generalized seizures	21.7%	-	-	-
BDI- II	Partial seizures	31.07	8.67	1.12	0.27
	Generalized seizures	28.70	7.16		
BDI- II ≥ 21	Partial seizures	100%	-	-	-
	Generalized seizures	100%	-	-	-
QOLIE-89					
Health Perception	Partial seizures	68.55	19.63	0.45	0.66
	Generalized seizures	66.12	23.07		
Overall QOL	Partial seizures	64.09	17.16	-1.67	0.10
	Generalized seizures	71.74	18.47		
Physical function	Partial seizures	85.48	22.14	0.24	0.81
	Generalized seizures	84.13	21.19		
Role limitations due to physical problems	Partial seizures	74.29	31.94	0.54	0.59
	Generalized seizures	69.57	37.11		
Role limitations due to emotional problems	Partial seizures	72.86	36.38	-2.16	0.05
	Generalized seizures	89.57	25.49		
Pain	Partial seizures	81.79	23.09	1.72	0.09
	Generalized seizures	70.33	29.96		
Work/driving/social function	Partial seizures	84.18	13.94	0.06	0.96
	Generalized seizures	83.99	11.37		
Energy/fatigue	Partial seizures	59.72	20.06	-0.9	0.37
	Generalized seizures	64.78	24.56		
Emotional wellbeing	Partial seizures	63.62	21.98	-1.85	0.07
	Generalized seizures	72.70	17.04		
Attention/concentration	Partial seizures	74.22	23.97	-1.77	0.08
	Generalized seizures	82.58	14.18		
Health discouragement	Partial seizures	77.38	21.98	-0.08	0.94

BHS: Beck Hopelessness Scale; BDI- II : Beck Depression Inventory- II ; QOL: Quality of life; QOLIE-89: Quality of life in Epilepsy-89; DF: Degree of freedom.

In order to assess those factors associated with higher hopelessness when controlling for the effect of other variables, variables significant at the bivariate level were included as predictors in a logistic regression model with patients having higher hopelessness *vs* those with lower scores on the BHS serving as the dependent variable (Table 4). Given that the diagnostic groups were associated with different levels of limitations in common social/role activities related to emotional problems, we also included the interaction between these variables in the model.

The multivariate model fits the data well ($\chi^2_{14} = 45.89$; $P < 0.001$), explaining 76% of the variability (Nagelkerke $R^2 = 0.76$). Patients with higher BHS scores (compared to those with lower BHS scores): (1) were 1.23 times more likely to be older ($P < 0.05$); (2) were 1.27 times more likely to have lower scores on the Overall score QOL of the QOLIE-89 ($P < 0.05$); (3) were 1.26 times more likely to report higher scores on the Energy/Fatigue subscale ($P < 0.05$); and (4) were 1.18 times more likely to report lower scores on the Emotional Wellbeing subscale ($P < 0.05$). It is important to note that depression severity failed to reach statistical significance when controlling for the effect of other variables (OR = 1.34; $P = 0.07$). Thus,

higher hopelessness is associated with some dimensions of QOL and age, while depressive symptomatology, as measured by the BDI- II, does not have an effect on hopelessness.

DISCUSSION

In the present study, patients with higher hopelessness scores, as assessed by BHS, were older and reported more severe depression on the BDI- II as compared to those with lower hopelessness scores. Moreover, after multivariate analyses, the patients with higher scores on the BHS were more likely to have lower scores on the Overall QOL score of the QOLIE-89, more likely to report higher scores on the Energy/Fatigue and Emotional Wellbeing subscales, and more likely to be older compared to those with lower hopelessness scores. Contrary to our expectations, depression severity failed to reach statistical significance in the prediction of hopelessness when controlling for the effects of other variables. This non-significant finding is most likely related to the fact that all the patients reported moderate to severe depression.

An association between epilepsy and major depression

Table 3 Differences between patients with scores of 9 or higher on the Beck Hopelessness Scale and patients with lower scores

		Mean	SD	t-tests (DF: 67)	Significance
Age	Lower hopelessness	35.04	14.37	-3.80	0.001
	Higher hopelessness	50.53	15.36		
Men (%)	Lower hopelessness	50.0%	-	-	0.11
	Higher hopelessness	29.4%			
Generalized seizures	Lower hopelessness	37.5%	-		0.39
	Higher hopelessness	29.4%			
BDI- II	Lower hopelessness	27.46	5.88	-4.84	0.001
	Higher hopelessness	38.24	8.53		
QOLIE-89					
Health Perception	Lower hopelessness	72.52	18.93	3.14	0.01
	Higher hopelessness	55.64	20.14		
Overall QOL	Lower hopelessness	70.25	17.03	3.69	0.001
	Higher hopelessness	54.85	14.10		
Physical function	Lower hopelessness	87.31	20.47	1.73	0.09
	Higher hopelessness	76.77	25.86		
Role limitations due to physical problems	Lower hopelessness	78.08	31.25	2.23	0.05
	Higher hopelessness	57.65	37.34		
Role limitations due to emotional problems	Lower hopelessness	86.92	26.83	3.27	0.01
	Higher hopelessness	52.94	39.96		
Pain	Lower hopelessness	81.88	22.92	2.46	0.05
	Higher hopelessness	64.56	31.24		
Work/driving/social function	Lower hopelessness	84.39	13.32	0.25	0.81
	Higher hopelessness	83.48	13.45		
Energy/fatigue	Lower hopelessness	66.22	20.13	3.11	0.01
	Higher hopelessness	48.53	21.05		
Emotional wellbeing	Lower hopelessness	73.08	17.64	4.76	0.001
	Higher hopelessness	49.41	18.27		
Attention/concentration	Lower hopelessness	79.29	21.80	0.86	0.39
	Higher hopelessness	74.25	18.25		
Health discouragement	Lower hopelessness	81.35	17.49	1.47	0.16
	Higher hopelessness	69.41	31.91		
Seizure worry	Lower hopelessness	63.33	22.50	1.99	0.051
	Higher hopelessness	51.23	19.23		
Memory	Lower hopelessness	71.43	25.39	2.27	0.05
	Higher hopelessness	55.08	26.84		
Language	Lower hopelessness	79.69	23.12	1.63	0.11
	Higher hopelessness	69.18	22.88		
Medication effects	Lower hopelessness	78.21	25.58	-0.43	0.67
	Higher hopelessness	81.21	22.77		
Social support	Lower hopelessness	75.24	20.448	1.73	0.09
	Higher hopelessness	64.71	25.76		
Social isolation	Lower hopelessness	88.65	17.60	2.45	0.05
	Higher hopelessness	71.18	27.59		
Change in health	Lower hopelessness	67.31	27.36	2.49	0.05
	Higher hopelessness	48.53	25.72		
Sexual relations	Lower hopelessness	63.73	28.86	1.50	0.14
	Higher hopelessness	51.47	29.94		
Overall Health	Lower hopelessness	72.50	19.29	3.21	0.01
	Higher hopelessness	55.63	15.04		

BDI- II : Beck Depression Inventory- II ; QOL: Quality of life; QOLIE-89: Quality of life in Epilepsy-89; DF: Degree of freedom.

has often been reported, and epileptic patients frequently show depressive symptoms, but a recent systematic review and meta-analysis of nine studies including 29891 patients with epilepsy^[40] reported a global prevalence of actual/past-year depression of only 23.1%. The high prevalence of depression found in our patients could be due to the fact that depression was diagnosed using a self-report instrument rather than clinical assessment. Significant heterogeneity in the results of ascertaining depression using different methods has been reported^[40].

Overall, the current findings were only partially in line with those of Jehi *et al*^[41], who analyzed data from

1931 subjects affected by drug-resistant and medically-controlled epilepsy during one year of follow-up and found that depression, together with seizure severity, was a major predictor of QOL in epileptic patients. Likewise, Lehrner *et al*^[42] reported that depression significantly predicted QOL in 56 patients with temporal lobe epilepsy. Boylan *et al*^[43] found that in a sample of 122 patients with refractory epilepsy, scores on the BDI were able to explain 51% of the total variance of the the QOLIE-31 scores, and only depression significantly predicted QOL. Gilliam *et al*^[44] reported that depression severity and adverse effects related to antiepileptic

Table 4 Logistic regression model (patients with Beck Hopelessness Scale scores < 9 as reference)

	Beta	SE	Wald	DF	Significance	OR	95%CI for OR	
							Lower	Upper
Age	0.21	0.09	50.02	11	0.05	1.23	1.03	1.47
BDI- II	0.30	0.16	30.38	11	0.07	1.34	0.98	1.84
Health Perception	-0.02	0.04	0.25	11	0.61	0.98	0.90	1.06
Overall QOL	-0.23	0.12	30.97	11	0.05	0.79	0.63	1.00
Role limitations due to physical problems	-0.01	0.03	0.08	11	0.77	0.99	0.94	1.04
Role limitations due to emotional problems	0.00	0.02	0.01	11	0.93	1.00	0.96	1.04
Pain	-0.08	0.05	20.97	11	0.09	0.92	0.85	1.01
Energy/fatigue	0.23	0.11	40.65	11	0.05	1.26	1.02	1.55
Emotional wellbeing	-0.16	0.08	40.38	11	0.05	0.85	0.74	0.99
Memory	-0.09	0.05	20.88	11	0.09	0.92	0.83	1.01
Social isolation	0.10	0.05	30.24	11	0.07	1.10	0.99	1.22
Change in health	-0.01	0.03	0.23	11	0.63	0.99	0.93	1.04
Overall health	-0.07	0.05	10.83	11	0.18	0.93	0.84	1.03
Diagnosis by role limitations due to emotional problems	0.02	0.02	0.75	1	0.39	0.98	0.95	1.02

QOL: Quality of life; SE: Standard error; DF: Degree of freedom.

medications were independent predictors of health status in a study of 205 outpatients with controlled and uncontrolled seizures. Luoni *et al*^[45] found that depressive symptoms were powerful predictors of HRQOL in patients with pharmacoresistant epilepsy. Many other studies have documented that depression is a significant predictor of QOL in epileptic patients^[12-14,43,46-52].

Consistent with the present findings, occasional researchers have found depressive symptoms to be unrelated to epilepsy. For example, Attarian *et al*^[53] did not find an association between depression severity and seizure rate in 143 epileptic outpatients.

In our study, patients with higher BHS total scores were more likely to have significant limitations and impairments in QOL as reported on the QOLIE-89. It is possible that poorly controlled seizures and their medical consequences may contribute to hopelessness that may reduce QOL and increase the risk for suicide in patients with epilepsy. In keeping with the findings from Jehi *et al*^[41], definitive conclusions concerning the eventual bidirectional association between hopelessness/depression and epilepsy are not easy to be drawn given the existence of spurious correlations from potential third variables. For example, both hopelessness/depression and epilepsy may be associated with reduced neurotrophic factors activity and altered signalling pathways related to neurotoxic effects such as hippocampal atrophy and memory/learning impairment^[54].

After multivariate analyses, the results indicated that those patients in our study who had generalized seizures reported more limitations in common social/role activities related to emotional problems compared to those patients with other types of seizures. This is consistent with the results of the study by Luoni *et al*^[45] who found that generalized seizures negatively predicted the “seizure worry” score according to the validated Italian version of the QOLIE-31. Tracy *et al*^[14] reported that, in a sample of 435 patients with predominant (56%) generalized seizures, the BDI- II score was the single reliable predictor of Emotional Well-Being subscale scores, explaining 37% of

its variance in a general linear model.

In our study, 21.7% of the patients with generalized seizures and 28.6% of the patients with other diagnoses reported BHS total scores ≥ 9 , indicating a higher suicidal risk. We have also found in a previous study that 26% of the total sample of patients affected by temporal lobe epilepsy had high levels of hopelessness as well as an elevated risk of committing suicide^[37]. Furthermore, Pompili *et al*^[55,56], in a meta-analytic analysis of research, found that suicide is more frequent both in epileptic patients and in those with epilepsy who have been surgically treated compared to the general population. Clearly, suicide in epilepsy is a significant and frequent event. This underlines the importance of identifying factors that increase suicide risk in an effort to reduce the risk. Interestingly, it has been reported that suicide mortality among epileptic patients is roughly the same as mortality due to epilepsy, suggesting that deaths by suicide are typically not included in global mortality epilepsy rates^[57]. Mortality rates in subjects with epilepsy are, therefore, presumably underestimated if they do not include deaths related to suicide.

In the present study we also found that older patients with epilepsy are at higher suicide risk when compared to younger patients. We hypothesize that epileptic patients develop higher hopelessness as they grow older about their current status and future life. However, older patients have been exposed to the illness for a longer period of time compared to younger patients. Our study did not control for years of illness limiting our ability to speculate about the association between the age of the patients with epilepsy and their hopelessness levels.

Limitations

One limitation of the present study is that we did not control for seizure severity. Subjects who are “seizure-free” often report having high QOL that resembles that of the general population^[8,9] although, in some of these individuals, comorbid mental disorders, in particular depression impair subjective wellbeing^[47,51,58,59]. Several

researchers^[60,61] have reported a negative association between seizure severity and QOL, and patients in whom seizures are controlled effectively using antiepileptic drugs/surgery may be more likely to experience an improvement in health-related QOL. Seizure severity and other seizure-related variables have been found to be strong predictors of psychiatric comorbidity and depression^[14,42,47,48,50].

Furthermore, the two groups of patients (those affected by epilepsy with generalized tonic-clonic seizures *vs* those having epilepsy with partial seizures) are not similar and a healthy control group was not available.

Other limitations include the small size of the present sample and the scarcity of information concerning seizure refractoriness, the number of psychoactive medications being taken, and seizure frequency. Further additional studies, including larger samples of patients with epilepsy, are required to investigate the complex relationship between depression, hopelessness, and QOL in epileptic patients. In addition, we were not able to ascertain the specific cause of the epilepsy (there are epilepsy subtypes that may be induced by external stimuli such as fever, toxin exposure, psychological distress).

In addition, we had insufficient information concerning seizure severity, seizure frequency, age at onset of seizures, duration of the illness, or number/type of psychotropic drugs, and so we were not able to evaluate the impact of these disease-variables on levels of hopelessness and QOL scores.

The patients were administered self-report measures that were not validated using an additional psychiatric examination, exposing the present findings to possible recall bias. In addition, the cross-sectional nature of this research further limits the generalization of the present findings. Lastly, all respondents reported moderate-severe depression, and this high prevalence of depression may indicate that the sample was highly selective and not representative of patients with epilepsy in general. However, the questionnaires were completed when the patients were admitted as outpatients for a seizure with no intervening period between seizure occurrence and mood evaluation.

Given the methodology which was used in the present study, a causal interpretation of the association between variables is not possible. Prospective follow-up studies using more advanced methodologies are required in order to make causal inferences about directional and developmental pathways underlying the variables involved in epilepsy.

Despite the limitations of the study, the current findings are consistent with existing results in the literature suggesting that, among patients with epilepsy, patients with higher hopelessness are more likely to have impairments in QOL compared to those with lower levels of hopelessness. Hopelessness in individuals with epilepsy needs to be identified as soon as possible in order to improve the QOL and reduce the burden of the disease. Prevention efforts to address recognized risk

factors for suicidality are also needed for patients with epilepsy. Further prospective studies, including larger samples, should be carried out to investigate the complex nature of the relationship between hopelessness and the QOL in patients with epilepsy.

COMMENTS

Background

Epilepsy is a disabling illness associated with psychosocial impairment and significant mortality. Improving the quality of life (QOL) in epileptic patients is one of the most important goals associated with a general reduction of the subjective burden of this disease. Multiple variables such as hopelessness may influence QOL and subjective wellbeing in patients with epilepsy.

Research frontiers

Previous studies have reported that hopelessness is a predictor of future suicide behaviors in patients with mood disorders and with a poor QOL in epileptic patients. However, the impact of hopelessness on the outcome of patients with epilepsy needs to be further elucidated.

Innovations and breakthroughs

An association between epilepsy and major depression has been commonly reported, and depression and seizure severity are major predictors of the QOL in epileptic patients. Patients with generalized seizures reported more limitations in common social/role activities related to emotional problems compared to patients with other types of seizures. Suicide is frequent in epileptic patients, and those patients with higher Beck Hopelessness Scale (BHS) scores are more likely to die by suicide than those with lower BHS scores. In this study, patients at increased suicide risk as evaluated by the BHS were older than those who had a lower suicidal risk.

Applications

Clinicians should carefully screen epileptic patients for limitations in common activities due to emotional problems, as well as the presence of hopelessness, in order to identify those patients with poor outcomes.

Terminology

The Beck Depression Inventory-II is a 21-item self-report instrument evaluating the presence/severity of depressive symptoms during the previous two weeks. The BHS is a 20-item self-report measure assessing hopelessness/negative attitudes about the future. Specifically, this instrument evaluates feelings about the future, loss of motivation, and negative expectations. The QOL in Epilepsy Inventory-89 (QOLIE-89) assesses specific domains regarding life in patients with epilepsy. The QOLIE-89 measures approximately 17 dimensions of the Health Related QOL, including individual's common social/role activities.

Peer review

The manuscript is well-written, interesting and useful for physicians.

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