Depression, hopelessness and suicide risk among patients suffering from epilepsy

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Summary. Suicide risk, as well as psychiatric disorder, has been repeatedly reported in the international literature as an important issue in the care of individuals suffering from epilepsy. In this pilot study a sample comprising 103 patients with a diagnosis of temporal lobe epilepsy, were collected from three clinics. The patients were administered the Beck hopelessness scale (BHS), the Beck depression inventory (BDI) and the Zung self-rating anxiety scale (SAS). Hopelessness has been identified as a construct linked to the prediction and the prevention of suicide. Twenty-six percent of the epileptic patients had scores ≥ 9 on the BHS, suggesting that they should be evaluated for suicidal inclinations. These patients were significantly older by about 9 years and had higher levels of depression and anxiety, but they did not differ in sex, age of onset of epilepsy or in their responsiveness to medication. In the logistic regression analysis, a hopelessness score ≥ 9 was predicted by BDI depression scores and SAS anxiety scores taking into account sex, age and response to epileptic medications. Despite a number of limitations, this pilot study adds support for the need for screening for suicide risk in patients with epilepsy. Both clinical and psychometric data should be part of the evaluation of the epileptic patient for psychiatric and suicidality assessment.

Key words: suicide, hopelessness, epilepsy, depression, anxiety.

Riassunto (*Depressione, disperazione e rischio di suicidio tra i pazienti affetti da epilessia*). Il rischio di suicidio, al pari dei disturbi psichiatrici, è stato più volte indicato dalla letteratura internazionale come un importante problema legato al trattamento dei pazienti affetti da epilessia. In questo studio pilota è stato creato un campione di 103 pazienti affetti da epilessia del lobo temporale, trattati presso tre strutture. I pazienti hanno completato la Beck hopelessness scale (BHS), il *Beck depression inventory* (BDI) e la *Zung self-rating anxiety scale* (SAS). La disperazione è stata identificata come un costrutto utile nel predire e prevenire il suicidio. Il 26% dei pazienti ha ottenuto un punteggio BHS ≥ 9, suggerendo che sarebbe indicato valutarli per le loro inclinazioni suicide. Questi pazienti sono significativamente più anziani di circa 9 anni e riportano livelli di depressione e ansia maggiori, ma non si differenziano per sesso, età di esordio della patologia e risposta alle terapie antiepilettiche. Nella analisi di regressione logistica, il punteggio elevato alla BHS (≥ 9) è predetto dai punteggi di depressione BDI e ansia SAS, tenendo in considerazione sesso, età e risposta alle terapie antiepilettiche. Nonostante il numero di limitazioni, questo studio pilota supporta la necessità di programmi di screening diretti ai pazienti affetti da epilessia. Sia dati psicometrici, sia dati clinici debbono essere considerati nel processo di valutazione dei disturbi psichiatrici e del rischio di suicidio.

Parole chiavi: suicidio, disperazione, epilessia, depressione, ansia.

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INTRODUCTION

According to the World Health Organization [1], epilepsy is one of the most common serious disorders of the brain, affecting about 50 million people worldwide. Epilepsy accounts for one percent of the global burden of disease. Eighty percent of this burden is in the developing world where, in some areas, as many as 80-90% of people with epilepsy receive no treatment at all.

It is important to recognize that epilepsy consists of more than seizures for the affected individual. Epilepsy results also in multiple, interacting, medical, psychological, economic and social repercussions, all of which need to be considered in order to understand fully the impact of this condition. Fear, misunderstanding and the resulting social stigma and discrimination surrounding epilepsy often force people with this disorder "into the shadows". The incidence (the number of new cases per year) of epilepsy is 24-53 per 100 000 per year in developed countries [2]. The prevalence (the total number of cases at a particular point in time) of active epilepsy has been shown to be fairly uniform at 4-10 per 1000 people [3]. In developed countries, mortality in epileptics, measured by the standardized mortality ratio (SMR), is two to three times greater than that of the general population.

Several studies have reported increased rates of adjustment problems and psychopathology [4-6]. Affective and anxiety disorders represent the most common comorbid disorders in epilepsy, although probably somewhat underestimated [7-12]. Common figures for depression in community-based studies are between 9-36% [13-16], while rates for hospitalized patients are generally higher, from 27% to 58% [17-19]. Depression significantly affects the quality of life and disability in people with epilepsy [16, 20, 21] and is a predictor of suicidal behavior.

Suicidal behavior in epileptics seems to be more frequent than that reported in the general population [22, 23], although some investigators have not found excess mortality due to this cause [24, 25]. However, the possibility of the underestimation of suicide risk among patients with epilepsy was stressed by a recent paper [26].

Figures reported are somewhat different from researcher to researcher, and a possible estimate of risk could be around a five times greater than expected [27]. Five to fourteen percent of patients with epilepsy have attempted or committed suicide [28]. Nevertheless, the standard mortality rate for the various categories of patients with epilepsy varies greatly, which is indicative of the heterogeneity of the phenomenon. For example, Barraclough [29], reviewing the literature, estimated a suicide rate 25 times greater than expected for temporal lobe epilepsy and five times greater for severe epilepsy.

Several risk factors for suicide in epileptics have been identified. A number of studies have reported that an increased suicide rate was associated with temporal lobectomy [30, 31], resection in the left region with worsening of seizures, and right temporal resection that led to the emergence of psychotic symptoms and increased severity of seizures [32, 33]. Suppression of seizures or full control of seizures has also been identified as a possible risk factor for suicide [30, 34].

The age at onset is another variable to take into account. Risk of suicide is greatest when the epilepsy starts in adolescence and when it is combined with a history of psychiatric disturbance. In cases of institutional care, suicide risk is also increased, possibly because of the severe handicaps in these patients [29].

Comorbidity with psychiatric disorders, mainly psychosis and the presence of psychological stressors, are other risk factors [35, 36], especially post- and inter-ictal psychopathology [25, 36]. For example, emergence of depression after surgical treatment among suicides was reported by Hennessy *et al.* [37] and Bladin [30]. Camfield *et al.* [31] reported that interictal dysphoric disorder, violent anger, and previous suicidal behavior were detectable among suicides.

This review of the literature indicates an increased risk of psychopathology and suicidal behaviour in epileptic patients and points to several risk factors for suicide. However, relevant studies are rare in Italian population. The aim of the present research was to study the level of depression and hopelessness in patients with epilepsy. Since both depression and hopelessness predict subsequent suicidal behavior [38], the present study may throw some light on the risk of suicide in Italian epileptic patients, where research is rare.

MATERIALS AND METHODS

The sample comprised 103 patients suffering from temporal lobe epilepsy. Thirty patients were studied at the Neurological Clinic of I Faculty of Medicine, "La Sapienza" University of Rome; 40 patients were studied at the Regional Center for the Study of Epilepsy, Santa Maria della Misericordia Hospital, Perugia; and 33 patients were studied at the Department of Neurosciences Division of Psychiatry University of Parma. Overall, there were 72 females and 31 males. All the patients, consecutively admitted over a 6-month period that met the inclusion/exclusion criteria, were asked to participate at the study. Inclusion criteria were a diagnosis of temporal lobe epilepsy, while exclusion criteria were a current diagnosis of dementia or delirium, active psychotic symptoms (delusions and hallucinations), illiteracy or any conditions affecting the ability to complete the assessment, and a refusal to give informed consent. All the patients who were eligible voluntarily agreed to participate the study and were administered several self-rating measures. Our sample may be considered to be a good representation of the overall population of our centers.

Table 1 reports the demographic and clinical characteristics of patients.

The patients were administered the following instruments:

- *the Beck hopelessness scale* [BHS] [39] is a 20-item scale for measuring negative attitudes about the future. Beck originally developed this scale in order

Table 1 | *Characteristics of epileptic patients (n. = 103)*

Variable	Mean ± SD	Range
Age	41.6 ± 14.1	19-78
Age of seizure onset	23.1 ± 16.6	0-72
Beck hopelessness scale (BHS)	6.4 ± 3.8	1-17
Zung self-rating anxiety scale (SAS)	37.7 ± 7.9	23-56
Beck depression inventory (BDI)	9.5 ± 8.5	0-38

to predict who would commit suicide and who would not. This powerful predictor of eventual suicide addressed three major aspects of hopelessness: feelings about the future, loss of motivation, and expectations. Responding to the 20 true-false items on the BHS, individuals can either endorse a pessimistic statement or deny an optimistic statement. Research consistently supports a positive relationship between BHS scores and measures of depression, suicidal intent, and suicidal ideation. Beck, *et al.* [38] carried out a prospective study of 1958 outpatients evaluated at the Center for Cognitive Therapy at the University of Pennsylvania School of Medicine, found that hopelessness, as measured by the BHS, was significantly related to eventual suicide. A cutoff score of 9 or above identified 16 [94%] of the 17 patients who eventually committed suicide [38]. According to that study, the high-risk group identified by this cutoff score was 11 times more likely to commit suicide than the rest of the outpatients. The BHS may, therefore, be used as a proxy indicator of suicide potential.

- *The Beck depression inventory* [40, 41] [BDI, BDI-II] is a twenty-one question multiple-choice self-report inventory that is one of the most widely used instruments for measuring the severity of depression. The questionnaire is designed for adults aged 17-80 and is composed of items relating to symptoms of depression such as hopelessness and irritability, cognitions such as guilt and feelings of being punished, as well as physical symptoms such as fatigue, weight loss and lack of interest in sex. There are three versions of the BDI: the original BDI, first published in 1961

and later revised in 1971 as the BDI-1A, and the BDI-II, published in 1996 (used in this investigation). The BDI is widely used as an assessment tool by healthcare professionals and researchers in a variety of settings. A cut-off higher than 9 was used to ascertain at least minimal symptoms of depression.

- *The Zung self-rating anxiety scale* [SAS] [42] is a 20-item scale, with some of the items keyed positively and some negatively. They are answered on a four-point scale ranging from 1 (none or a little of the time) to 4 (most or all of the time). A cut-off of 46 was used to ascertain at least moderate symptoms of anxiety.

Patients signed an informed consent form and voluntarily took part in this research.

STATISTICAL ANALYSIS

Statistical analysis of differences in the frequency of categorical variables was performed by means of odds-ratio using a 95% confidence interval. Comparisons between means were performed by means of the Student's t-test for independent samples. A logistic regression model was run to evaluate the differences between epileptic patients with BHS score ≥ 9 *vs* those with a BHS score < 9. BDI depression scores were split ≤ 9 *vs* > 9 and SAS anxiety scores were split < 46 *vs* ≥ 46.

Values were expressed as mean ± S.D. The 5% level of statistical significance was used. All statistical analyses were performed using SPSS *(version 13.0)* software *(Tables 2 and 3)*.

RESULTS

Twenty-six percent of the epileptic patients had scores ≥ 9 on the BHS, suggesting that they should be evaluated for suicidal inclinations. These patients were significantly older by about 9 years and were three to four times more likely to have higher levels of depression and anxiety. They did not differ in sex, age of onset of epilepsy or in their responsiveness to medication. In the logistic regression analysis, a hopelessness score ≥ 9 was predicted by BDI depression scores and SAS anxiety scores after controlling for sex, age and response to epileptic drugs.

Table 2 | *Comparison between epileptic patients with BHS score ≥ 9 vs those with a score of BHS < 9*

Variable	Patients with BHS ≥ 9 (n. = 27)	Patients with BHS < 9 (n. = 76)	p or OR (CI 95%)
Sex (M/F)	8/19	23/53	1.0 (0.4-2.7)
Age	48.3 ± 14.1	39.3 ±13.4	0.004
Age of seizure onset	27.5 ± 20.1	21.7 ±15.1	ns
Response drugs (y/n)	18/9	56/20	0.7 (0.3-1.8)
BDI (> 9 vs ≤ 9)	18/9	25/51	4.1 (1.6-10.4)
SAS (≥ 46 *vs* < 46)	9/18	11/65	2.9 (1.1-8.2)

BHS: Beck hopelessness scale; BDI: Beck depression inventory; SAS: Zung self-rating anxiety scale; p: statistical significance.

Table 3 | *Logistic regression analysis to evaluate the relation between BHS scores and the evaluation of depression and anxiety adjusted for some variables (sex, age and response to epileptic drugs)*

	B	p	OR	95% CI	
				Lower	Upper
BDI	1.11	0.04	3.05	1.05	8.80
Zung-SAS	0.78	0.22	2.19	0.63	7.64
Response to epileptic drugs (y/n)	0.33	0.55	1.39	0.48	4.05
Age	0.05	0.08	1.05	1.01	1.09
Sex (M/F)	0.13	0.82	1.14	0.36	3.60

B: regressor's coefficient; p: statistical significance; OR: odds risk; CI:confidence intervals; BHS: Beck hopelessness scale; BDI: Beck depression inventory.

Table 4 | *Assessment of suicide risk should be carried out in patients suffering from epilepsy and for those epileptic patients who are surgically treated (Adapted from 43)*

• Identify the multiple contributing factors
• Conduct a thorough psychiatric examination, identifying risk factors and protective factors and distinguishing risk factors which can be modified from those which cannot
• Ask directly about suicide
• Determine level of suicide risk: low, moderate, high
• Determine treatment setting and plan
• Investigate past and present suicidal ideation, plans, behaviors, intent; methods; hopelessness, anhedonia, anxiety symptoms; reasons for living; associated substance use; homicidal ideation
• Warning signs: expressing suicidal feelings or bringing up the topic of suicide; giving away prized possessions, settling affairs, making out a will; signs of depression: sad mood, alterations in sleeping/eating patterns; change of behavior (poor work or school performance); risk-taking behaviors; increased use of alcohol or drugs; social isolation; developing a specific plan for suicide

DISCUSSION

The present study found that about one-quarter of a sample of patients with epilepsy had high levels of hopelessness. According to criteria developed by Beck *et al.* [38], these patients are at increased risk of engaging in fatal suicidal behavior. Thus, these patients should be evaluated for their suicidal potential and watched carefully while under treatment.

Interestingly, a high level of hopelessness was associated with high levels of depression in general (including components other than the cognitive component) and anxiety. The increased level of anxiety suggests an energizing factor which may increase the likelihood of suicidal acting-out behavior.

Age was also found to be predictive of high levels of hopelessness, indicating that older patients with epilepsy may be at higher risk of suicidal behavior than younger patients. Perhaps, as patients with epilepsy grow older, they become more hopeless about their condition and their prospects for the future.

This study has a number of limitations. First of all, the nonprobability method of sampling used in our study may limit the generalizability of the results. Also, the findings, based on diagnostically complex and relatively treatment-resistant subjects, may not generalize to other groups. Furthermore, by not taking into account other subtypes of epilepsy, we were unable to identify whether any particular subtype of epilepsy was associated with higher morbidity and suicide risk. However, grouping epilepsies for the various subtypes indicates that suicide risk is much higher than in the general population [23, 26]. As part of an ongoing investigation comprising various institutions in Italy, this preliminary report comprised patients gathered in three centres which may bias the psychometric evaluation of patients.

A thorough psychiatric investigation, with proper clinical assessment of suicide risk including past suicidal behavior, was not conducted as the patients were interviewed during their neurological consultations. Interactions between neurologists and psychiatrists is therefore highly recommended for better screening for patients at risk of suicide or suffering from psychiatric disorders.

Despite these caveats, this investigation represents an important first step in the evaluation and understanding of the alarming phenomenon of suicidal risk among patients with epilepsy. One important implication of the present study for public health is the importance of screening for suicidal risk as well as depression and anxiety in this group of patients. Implementation of such a procedure will certainly help to prevent suicide *(Table 4)*.

It would be useful in future research to follow up samples of this type of patient to see how many and which patients do engage in fatal and non-fatal suicidal behavior. In addition, since the present sample was restricted to patients with temporal lobe epilepsy, it would be of interest to extend the study to other types of epileptic patients.

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