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Depression in epilepsy: a cross-sectional hospital-based study

Abstract

Background: Depression is one of the frequently diagnosed psychiatric comorbidities in epilepsy. Antiepileptic drugs and chronic nature of the illness are associated with depressive symptoms in epilepsy. **Aim:** The aim of the study is to evaluate the prevalence of depression and severity of depressive symptoms in patients with epilepsy attending a tertiary care teaching institute and to compare the clinical profile of depressed and non-depressed patients with epilepsy. **Method:** This was a cross-sectional study. Sixty-three follow-up adult patients of epilepsy were enrolled in the study after fulfilling the selection criteria. Depression was diagnosed as per the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) criteria. Quantification of depression was done with the Hamilton Depression Rating Scale (HDRS). A p-value less than 0.05 was considered significant in the study. **Result:** 23.9% (n=15) of patients with epilepsy had depression. Mild depression was found in 53.3% patients where moderate depression was in 33.3% patients and 13.3% cases were found to be severely depressed. On comparisons between depressed and non-depressed epilepsy patients, none of the clinical characteristics were found to be statistically significant, but regarding polytherapy and duration of epilepsy the result was in accordance with the previous studies. **Conclusion:** Total 23.9% patients were found to have depression. Although severe depression was found in 13.3% cases, none of the patients had suicidal intent. Evaluation of depression should be included in a routine assessment of these populations. The association of clinical characteristics in depression needs further evaluation and follow-up.

Keywords: Antiepileptic. Polytherapy. Drug compliance.

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INTRODUCTION

Epilepsy is a common neurological disorder, which is chronic in nature. Because of its chronic nature, it impairs individual, social, and occupational functioning. It also affects the individual's quality of life. According to a community-based study, prevalence of epilepsy in India is one-eight of the total epilepsy in the world.[1] Depression is a common psychiatric illness found in epilepsy and its prevalence rate is linked to a degree of seizure control. Major depressive disorder is found in 20-55% of recurrent seizure only, the prevalence rate is decreased to three to nine per cent in the case of well-controlled seizure.[2] Depression has been found to be an independent risk factor for unprovoked seizure.[3] Antiepileptic drugs, particularly phenobarbitone is found to be associated with increased suicidal behaviour in patients with epilepsy.[4] Evaluation of depression in patients with epilepsy is done by using various screening tools globally. The estimation of depressive disorder in epilepsy is not done earlier in Gauhati Medical College and Hospital (GMCH), Guwahati, Assam, India. So, we want to explore the actual magnitude of the problem in this population by using diagnostic criteria and aim of our study is evaluation of depression in patients with epilepsy.

Aim and objective of the study

1. Evaluation of depression in patients with epilepsy
2. To compare the clinical profile between depressed and non-depressed groups.

METHOD AND MATERIAL

The cross-sectional study was carried out in the Department of Neurology of GMCH where there is no separate epilepsy clinic. Study duration was six months from March, 2018 to September, 2018. Ethical clearance for the study was obtained from the Institutional Ethics Committee.

Study participants

Study participants were the follow-up patients of epilepsy comprising of 63 in number and enrolled in the study after fulfilling the inclusion criteria.

Inclusion criteria

1. Both male and female follow-up patients of epilepsy and diagnosed by neurologists as per the International League against Epilepsy.[5]

2. Age between 18 to 60 years.
3. Duration of epilepsy should be more than 12 months.
4. Willing to give informed consent.

Exclusion criteria

Patient with psychosis, alcohol and cannabis abuse, other neurological disorder, and mental retardation were excluded from the study.

Data collecting procedure

Participants who fulfilled the inclusion criteria were evaluated with detailed history and mental status examination by senior psychiatrist. Patients' particulars were recorded in the sociodemographic datasheet regarding family history of psychiatric illness and history of epilepsy. Patients with single antiepileptic drug and more than one was considered as in monotherapy and polytherapy respectively. Regarding the evaluation of drug compliance, information was also gathered from the informant. Age at onset of first seizure we had not included due to recall bias, hence the duration of seizure included in three categories. Those having seizure duration of one to five years were grouped one, seizure duration six to ten years were in group two, and seizure duration of more than ten years were in group three. To evaluate seizure control, we divided them into three categories. Those patients having one to two attacks of seizure per month was termed as poor group, one to two attacks per year was termed as fair, and no attack per year was considered as good seizure control. During the evaluation, the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5)[6] criteria were used for the diagnosis of depression. Patients who fulfilled the criteria for depression were further evaluated for severity of depression with the help of the Hamilton Depression Rating Scale (HDRS).[7]

Description of tools

1. Semi-structured sociodemographic and clinical data proforma
2. DSM-5[6]
3. The 17-item HDRS[7]

HDRS was introduced and developed by Max Hamilton in 1960 to monitor the severity of major depression. It is an observer rated scale consisting of 17 to 24 items. In this study, we applied 17 items' scale and total score ranging from zero to 50.

Data analysis

Data were recorded in Microsoft Excel sheet. Statistical analysis was done with chi-square and descriptive statistics. p-value <0.05 was considered significant in this study.

RESULTS

In this study, the total number of 63 patients were assessed and the mean age of the sample was 32.2±13.3 years. Table 1 shows the sociodemographic profile of patients with epilepsy.

Table 2 shows the clinical variables of patients with epilepsy. Duration of epilepsy had been divided into three categories. Family history of psychiatric illness in first degree relatives included schizophrenia-like psychosis and mood disorder.

Table 1: Sociodemographic profile of patients with epilepsy

Variable	N	%
Sex		
Male	44	69.8
Female	19	30.2
Religion		
Hindu	52	82.6
Islam	11	17.5
Locality		
Rural	38	60.4
Urban	25	39.7
Family type		
Nuclear	55	87.4
Joint	8	12.7
Marital status		
Married	29	46.1
Single	32	50.8
Widow	1	1.6
Divorced	1	1.6
Occupation		
Employed	9	12.3
Unemployed	33	52.4
Self-employed	21	33.3
Education		
Illiterate	10	15.9
School	36	57.2
College	15	23.9
Professional	2	3.6

Table 3 represents the depressed group of epilepsy according to HDRS.[7]

Table 4 represents the comparison of clinical variables between depressed and non-depressed epilepsy patients. The difference in antiepileptic monotherapy and polytherapy between the depressed and non-depressed groups was statistically not significant (p=0.12). Similarly, comparison of drug compliance between the depressed and non-depressed groups was found to be statistically not significant (p=0.63). Comparison of duration of illness, seizure type, and family history of epilepsy between the depressed and non-depressed groups revealed that the difference was not statistically significant (p=0.24, 0.76, and 0.43 respectively). Regarding the frequency of seizure or seizure control between depressed and non-depressed groups, the difference was not statistically significant (p=0.72).

Table 2: Clinical variables of patients with epilepsy

Variable	N	%
Seizure type		
Generalised	53	84.2
Focal	10	15.8
Antiepileptic drug		
Monotherapy	36	57.2
Polytherapy	27	42.9
Drug compliance		
Satisfactory	43	68.3
Unsatisfactory	20	31.8
Duration of illness (in years)		
1-5	28	44.4
6-10	15	23.9
>10	20	31.8
Seizure control		
Good	20	31.8
Fair	34	54.0
Poor	9	14.3
Family history of psychiatric illness	6	9.5
Family history of epilepsy	7	11.1

Table 3: Severity of depression according to HDRS

Total depression		Severity of depression					
		Mild		Moderate		Severe	
N	%	N	%	N	%	N	%
15	23.9	8	53.3	5	33.3	2	13.3

HDRS: Hamilton Depression Rating Scale[7]

DISCUSSION

Our study found that the prevalence of depression in adult patients with epilepsy was 23.9% and the mean age of the study sample was 32.2±13.3 years. This finding was higher than the previous Indian study in which, Babu *et al.*[8] reported in their prospective study that depression in patients with epilepsy was 5.2% and mean age of the sample was 29.66±11.31 years. But, Chandrasekharan *et al.*[9] reported a high frequency of depression up to 63% in adult patients with epilepsy in a tertiary care hospital. In their study, out of 150 adult patients with epilepsy, 95 patients had depressive symptoms. The depressive symptoms were evaluated using the Patient Health Questionnaire-12 (PHQ-12). A cross-sectional study by Surendran *et al.*[10] also reported depression in 69% of patients with epilepsy. The presence and the severity of depression was evaluated using self-administered PHQ-9. The high prevalence of depression in their study could be due to the use screening tool. Another cross-sectional study from India observed clinically relevant depression in 23.9% of patients with epilepsy.[11] The evaluation of depression was done by using the Hospital Anxiety and Depression Scale (HADS-D) and PHQ-2 in a tertiary care institute. The frequency of depression in patients with epilepsy was in accordance with our study.

Jones *et al.*[12] reported in a multicentric tertiary care study that out of 174 patients with epilepsy, 17.2% had fulfilled DSM-IV text revision (DSM-IV-TR) criteria for major depressive disorder. Mendez *et al.*[13] evaluated depression with HDRS in 175 patients with epilepsy and found that 55% patients met the criteria for depression. This finding was higher than our study. The low prevalence of depression in our study may be due to the use of DSM-5 criteria for diagnosis of depression and we applied HDRS to assess the severity of depression.

The United States (U.S.) Food and Drug Administration (FDA) analysis had reported regarding 11 antiepileptic

Table 4: Clinical variables of depressed and non-depressed epilepsy patients

Variable	Depressed (N=15)		Non-depressed (N=48)	Chi-square (df)	p-value
Family history of epilepsy	3 (20%)		4 (8.3%)	0.615 (1)	0.43*
Antiepileptic drug	Monotherapy	6 (40%)	30 (62.5%)	2.362 (1)	0.12
	Polytherapy	9 (60%)	18 (37.5%)		
Drug compliance	Satisfactory	11 (73.3%)	32 (66.7%)	0.234 (1)	0.63
	Non-satisfactory	4 (26.6%)	16 (33.3%)		
Duration of illness	1-5 years	4 (26.7%)	24 (50%)	2.848 (2)	0.24
	6-10 years	4 (26.7%)	11 (23.9%)		
	>10 years	7 (46.7%)	13 (27.1%)		
Seizure type	Generalised	13 (86.7%)	40 (83.3%)	0.095 (1)	0.76*
	Focal	2 (13.3%)	8 (16.67%)		
Seizure control	Good	5 (33.3%)	15 (31.25%)	0.660 (2)	0.72
	Fair	7 (46.6)	27 (56.25%)		
	Poor	3 (20%)	6 (12.5%)		
Family history of psychiatric illness	2 (13.3%)		4 (8.3%)	0.005 (1)	0.94*

*Yates correction
df: Degree of freedom

drugs associated with suicidal behaviour in patients with epilepsy,[14] but in our study none of the depressed patients had suicidal intent. Depression and epilepsy, both are risk factors for each other. Depression is an independent risk factor for unprovoked seizure, according to Hesdorffer *et al*.[3] which is more prevalent in patients with focal seizure. But in our study, 13.3% of patients with focal seizure had depression in comparison to 16.7% of focal seizure who had no depression, although the difference was statistically not significant (p-value=0.92).

In our study, seizure control was compared between depressed and non-depressed group, and found that association of seizure control or seizure frequency with depression was not statistically significant (p-value=0.72), in contrary to previous study.[15] Regarding family history of psychiatric illness in the depressed group, two (13.3%) patients had a psychiatric illness in the form of mood disorder and schizophrenia-like psychosis in contrast to the non-depressed group where four (8.3%) patients had a psychiatric illness although the difference was statistically not significant (p-value=0.94).

Depression could be a comorbidity in epileptic patients as reported by Kanner[16] in his study and there may be underlying common abnormal monoaminergic mechanism in epilepsy and depression. It was observed that depression can affect the outcome of epilepsy due to poor medication adherence and poor quality of life. Various studies had observed that patients with major depressive disorder and temporal lobe epilepsy; in both the conditions, there is decreased 5-hydroxytryptamine 1A (5-HT1A) receptor binding in hippocampus, amygdala, raphe nucleus, and cingulate gyrus.[17,18] Hence depression and epilepsy share common pathogenic mechanism. Common underlying mechanism in epilepsy and comorbidities had also been reported by Mazarati and Sankar.[19]

Polytherapy with antiepileptic medication was not associated with statistically significant difference between the depressed and non-depressed group (p-value=0.12). This was in contrast to the finding of previous study.[20] In this study, 42.85% patients received more than one antiepileptic drug. The duration of epilepsy was not significantly associated with the depression in this study (p-value=0.24). But our finding was similar with the result of Chandrasekharan *et al*.[9] regarding no statistically significant association of polytherapy and duration of epilepsy with depression.

Among the antiepileptic drugs, specially phenobarbitone was found to be associated with depression in epilepsy,[4] but in this study, in the depressed group, only two patients received phenobarbitone along with other antiepileptic drugs as a polytherapy. The antiepileptic drugs received as a monotherapy in depressed patient with epilepsy in the present study were levetiracetam, sodium valproate, and phenytoin sodium. In this study, although we have not found the statistically significant association of various clinical variables with depression, but depression can provoke seizures due to sleep deprivation and development of seizure may worsen the depression.[21] The prevalence of depression in patients with epilepsy in our study also could be due to shared common neurobiological mechanism as reported by previous study.[18] Although we have observed that depression is common in patients with epilepsy, but 70.3% of them were not treated for depression.[22] The routine evaluation of depressive symptoms in patients with epilepsy in a tertiary care centre will have positive impact on quality of life of these individuals.

Strength of the study

DSM-5 criteria have been used in this study instead of validated screening tool or questionnaire.

Limitation of the study

Being a cross sectional study, the impact of psychosocial stressors on the chronicity of the illness could not be assessed and the depressive phase of bipolar mood disorder could not be ruled out.

Conclusion

As depression is prevalent in 23.9% of cases with adult epilepsy in our study, the evaluation of depression of these individuals in the epilepsy clinic during neurological assessment should be a routine practice. Liaison between neurologist and psychiatrist will provide better clinical assessment and care. Regarding the impact of polytherapy, duration of epilepsy and seizure frequency of mood status of the epileptic patients need a further evaluation with larger sample size and follow-up.

AUTHOR CONTRIBUTIONS

MD: Concepts, design, definition of intellectual content, literature search, clinical studies, data analysis, manuscript preparation, manuscript editing, manuscript review, guarantor; **BH:** Concepts, design, definition of intellectual content, literature search, clinical studies, data analysis, statistical analysis, manuscript preparation, manuscript editing, manuscript review, guarantor; **MB:** Clinical studies, data acquisition, manuscript preparation; **JB:** Clinical studies, data acquisition, manuscript preparation.

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