



## A study of Major Depressive Disorder in Patients with Seizure Disorder

Authors

**Dhiraj N. Bhivgade, Nidhi Nagori\*, Bharat N. Panchal**

Department of Psychiatry, Government Medical College, Bhavnagar, Gujarat

\*Corresponding Author

**Nidhi Nagori**

C-303, Meghna Complex, U.M. Road, Surat-395017, Gujarat, India

Mobile no: 9687153954 Email: [nidhi.nagori12@gmail.com](mailto:nidhi.nagori12@gmail.com)

### Abstract

**Background:** Epilepsy is chronic neurological disorder that have profound physical, social and psychological consequence. The prevalence of depression is much more in patients with seizure disorder. We studied the frequency of major depressive disorder in patient with seizure disorder.

**Methods:** This was a single-centered, cross sectional, observational, questionnaire based study. Hundred patients who attended psychiatry outpatient department of tertiary care hospital with history of seizure disorder at-least for one year duration were included in the study, diagnosis of major depressive disorder was done by clinician administered interview as per DSM-V. The patients assessed for demographic details, NHSSS (National Hospital Seizure Severity Scale) and HAM-D (Hamilton rating scale for depression). Data were analyzed by Graph Pad In Stat version 3.06

**Results:** Frequency of major depressive disorder in patient with seizure disorder is 33%. The patient with major depressive disorder showed higher score on HAM-D ( $p < 0.0001$ ).

**Conclusion:** Patient with seizure disorders are prone to Major Depressive Disorder with higher HAM-D score.

**Keywords:** Depression, Seizure Disorder, HAM-D, Seizure Severity.

### Introduction

Epilepsy is a long standing chronic illness affecting all dimensions of life in patients with epilepsy. These patients are at an increased risk of depression and have more anxiety related to recent occurrence of seizure.

Incidence of depression and anxiety is much more in patients with seizure disorders. Psychosocial factors such as adjustment difficulties, limitation and restriction in social setting which disorder imposes, as well as unpredictable nature of seizure and associated feeling of helplessness and loss of control over one's life are some of the important effects of seizure disorders.<sup>[1]</sup>

Depression and anxiety have been reported to be most common psychological co-morbidity with epilepsy<sup>[2]</sup>.

Seizure severity is an important aspect of epilepsy. Depression is most influential factor for seizure severity as noted by Cramer et al. in 2003<sup>[3]</sup>.

In UK an epidemiological study suggests that the prevalence of epilepsy is between 0.5 to 1 person per hundred.<sup>[4]</sup> In India prevalence rate of epilepsy per 1000 is 5.59, male 6.05 and female 5.18.<sup>[5]</sup> The point prevalence of depression noted in many studies is 50 -55%<sup>[6]</sup>. Various causative factors are put forward for causation of depression in epilepsy. Depression and epilepsy have common

pathogenesis ie. abnormality of various neurotransmitter in CNS. (serotonin, noradrenaline, dopamine). Others factors are psychosocial factors and side effects of antiepileptic drugs (AEDs); Psychosocial factors experienced as direct effect of epilepsy are perceived stigma, fear of seizure ,discrimination , joblessness, lack of social support ,and lifestyle changes imposed by increased seizure severity./frequency have been contributing to depression .(Torta & Keller,1999-25)<sup>[7]</sup>.

Depression is most important factor for assessing seizure severity. Depressed patients reports high level of seizure severity than non depressed patients.

**Materials and Methods**

100 adult patients from psychiatry outpatient department of having seizure disorder of duration one year were recruited. Those patient having previous history of psychiatric illness and on psychotropic medications or with any other medical illness were excluded from study.

With informed consent and prior approval of ethic committee, interview of every patient was taken on demographic variables like age, gender, residence, marital status, occupation, education, duration of seizure disorder, number of antiepileptic drugs, family history of seizure disorder, past history of any psychiatric illness, substance history, and EEG finding were recorded. Diagnosis of major depressive disorder was done using DSM -5 criteria's by clinician.

Participants were further interviewed for seizure severity by National Hospital Seizure Severity Scale. Its content seven seizure related factors and generate score from 1 to 27. Participants were further interviewed for depression by using Hamilton rating scale for depression (HAM D).It is a 17 items observer rated scale for assessing severity of Depression.

Qualitative data is expressed in proportion and quantitative data is expressed in Mean ± Standard deviation (Mean± S.D.). Statistical analysis was done with Graph Pad In Stat version 3.06. Proportions were compared using Chi -Square test while score of HAM D and NHSSS were compared

by using Mann -Whitney test or Kruskal Wallis test followed by Dunn post test multiple comparison. P <0.05 was considered statistically significant.

**Results**

We have evaluated hundred consecutive adult patients with seizure disorder of at-least one year period of seizure disorder duration who attended the psychiatric outpatient department in our tertiary care hospital.

Frequency of Major Depressive Disorder was 33% among 100 patients evaluated.

Diagnosis of Major Depressive Disorder was made by clinical interviews administered by consultant psychiatrists as per the DSM-V criteria.

Demographic details are shown in Table 1.

**Table: 1** Demographic variables according to Depressed and Non-Depressed patient with seizure disorder

	Depressed N=33	Non depressed N=67	P value
Age	31.87±11.5	30.89± 10.5	P=0.7194
Gender			
Male (66)	21	45	P=0.762
Female (34)	12	22	
Occupation			
Laborer (45)	14	31	P=0.9230
Non-laborer (24)	8	16	
Not-working (31)	11	20	
Address			
Rural (32)	10	22	P=0.9393
Urban (49)	17	32	
Town (19)	6	13	
Education			
Illiterate(16)	6	10	P=0.6886
Up to school (71)	24	47	
Graduate and more (13)	03	10	
Marital status			
Married (69)	22	47	P=0.7233
Unmarried (31)	11	20	
Duration of seizure disorder(years)	8.106±6.2	11.20±7.8	P=0.0419
Family history			
Yes (13)	5	8	P=0.6534
No (87)	28	59	
Substance History			
Yes (22)	09	13	P=0.3717
No (78)	24	54	
EEG (Electroencephalograph)			
Positive (11)	03	08	P=0.6685
Negative (89)	30	59	
Last seizure occurs			
1 wk (22)	10	12	P=0.3825
4wk (19)	7	12	
6months (19)	4	15	
>6month (40)	12	28	
Seizure free period			
1 wk (19)	9	10	P=0.3181
4wk (18)	7	11	
6months (19)	4	15	
>6month (44)	13	31	

Participants were divided in two groups; with MDD (n=33) and without MDD (n=67). Participants with major depressive disorder scored significantly higher value in HAM-D and NHSSS when compared with patient without major depressive disorder as shown in Table .2.

**Table 2:** Association of depression in patient with severity of depressive symptoms (HAM D score) and seizure severity (NHSSS score).

	Depressed (n=33)	Non depressed (n=67)	P value
HAM-D	17.36±5.5	8.62 ± 4.6	P< 0.0001
NHSSS	14.96±4.6	13.2± 4.5	P=0.02

HAM-D-Hamilton rating scale for depression, NHSSS- National Hospital Seizure Severity Scale.

## Discussion

The study focused on Major Depressive Disorder with Seizure Disorder. We have found that frequency of Depression is 33% among patients with seizure disorder which is in consistent with study conducted by Rajesh Jacob et al where the frequency of Depression among epileptic patients came to be 34%<sup>[8]</sup>.

The age of patient ranged from 18 to 60 years with mean (SD) of 31.38 (10.5) years. As shown in demographic table, most of the patient were male (66), laborer (45), from urban area (49), studied up to school (71), married (69), had no family history of seizure disorders (87), no history of substance use (78), with EEG not suggestive of seizure activity (89), seizure free period of more than one week (81) and on more than one AED (53). There was no statistically significant difference seen in above parameters with respect to depressed and non depressed participants. Age of the patient who have epilepsy did not affect the occurrence of depression disorder. This is in contrast to previous study which supported that age of patient affects this<sup>[9],[10]</sup>.

It is known that psychiatric co morbidities are prevalent in epilepsy and depression is the most frequent co morbidity<sup>[7],[11],[12],[13]</sup>.

Devellis et al.<sup>[14]</sup> applied the theoretical framework of learned helplessness to individuals with epilepsy, and incorporated seizure severity into the factors contributing to helplessness. They predicated their research on the assumption that exposure to

naturally occurring aversive, uncontrollable stimuli, such as a seizure, can produce learned helplessness in a naturalistic setting, outside the laboratory. They found that seizure severity, frequency, and perceived controllability or predictability of seizures contribute significantly to learned helplessness scale scores. These results supplement the findings of our present study, which suggest that the seizure experience can result in occurrence of depressive symptoms.

Although a clear directional relationship of the association between depression and seizure severity has not been demonstrated, patients with epilepsy frequently report emotional stress as a seizure precipitant<sup>[15]</sup>. It is therefore possible that the direction of the relationship is a worsening of seizure frequency and severity caused by emotional stress and depressive symptoms. These observations should provide an impetus for further exploration into the complexity of explaining the relationship of seizure severity to psychiatric co-morbidity and in patients with epilepsy.

## Conclusion

Patient with seizure disorders are prone to Major Depressive Disorder with higher HAM-D score so its diagnosis and timely management must be done efficiently to avert complications related to depression itself including the possibility of worsening the seizure disorder.

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