



## Original article

# A hospital based cross sectional study on comorbid psychiatric problems in persons with epilepsy from north eastern part of India

Sajjadur Rehman<sup>a,\*</sup>, Kamal K. Kalita<sup>b</sup>, Aparajeeta Baruah<sup>c</sup><sup>a</sup> Dept. of Psychiatry, Lady Hardinge Medical College New Delhi, 110001, India<sup>b</sup> Dept. of Psychiatry, LGB Regional Institute of Mental Health Tezpur, Assam, 784001, India<sup>c</sup> Dept. of Psychiatry, LGB Regional Institute of Mental Health Tezpur, Assam, 784001, India

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## ABSTRACT

**Context:** The relationship between epilepsy and psychiatric disorders has been recognized for a long time. Psychiatric disturbances like depression, anxiety disorder, psychosis, panic disorder, suicidal behavior etc are associated with epilepsy. Different demographic and clinical factors are associated with the onset of these psychiatric disturbances.

**Aims:** To study the prevalence of psychiatric comorbidity in persons with epilepsy. Also assess the different demographic and clinical factors and its relation with the presence of psychiatric comorbidity in persons with epilepsy.

**Settings and design:** It was a cross sectional observational study.

**Methods and material:** Diagnosed cases of epilepsy, attending Epilepsy Clinic, fulfilling the inclusion and exclusion criteria were recruited for the study. Patients were evaluated with Mini International Neuropsychiatric Interview (MINI) to see their psychiatric comorbidities and also the socio-demographic and clinical factors were assessed

**Statistical analysis used:** SPSS version 23.0 for Windows and Graph Pad InStat software trial version 3.1 was used for analysis.

**Results:** Psychiatric comorbidity was seen in 50% subjects with comorbid with epilepsy. Depression 18%, Psychosis 14% and Anxiety Disorders 11%, were the most commonly found psychiatric morbidities. Presence of partial seizures, frequent seizures, long duration of epilepsy and poor compliance to antiepileptic drug were significantly associated with presence of psychiatric comorbidity in persons with epilepsy.

**Conclusions:** Psychiatric comorbidities are very common in epilepsy. Psychosis associated with epilepsy is seen more in hospital settings. Depression and anxiety though commonly reported in studies are less commonly presented to tertiary care settings.

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## 1. Introduction

Since time immemorial, persons having epilepsy were seen as having mental disorder and suffered discrimination. Ignoring the possibility of having a comorbid psychiatric disorder became an accepted means of fighting the stigma associated with the illness.<sup>1</sup> Epilepsy treated in neurology clinics focused more on the seizure semiology, its origin & progression and relationship with the brain structures. As controlling the seizures improved the comorbid mental illness, hence psychiatric comorbidities were viewed as

secondary reaction to the underlying seizure disorder and therefore believed to require no treatment.<sup>2</sup>

The prevalence of psychiatric comorbidity is higher in persons with epilepsy than general population. It ranges from 19%–62% across studies.<sup>3,4</sup> A gradient in prevalence is seen, with lower figures reported in community, higher among those visiting family physician and highest in speciality clinics.<sup>5</sup>

The psychiatric disorders associated with epilepsy are depression, anxiety disorder, panic disorder, obsessive compulsive disorder, psychosis and personality changes. Depression and anxiety were most frequently reported, though hospital studies reporting a higher prevalence of depression.<sup>6</sup>

High rates of unemployment, lower education and being single is reported more in persons with epilepsy than without. Psychiatric comorbidities were seen more among persons with focal seizure

\* Corresponding author.

E-mail addresses: [sajjadur25@gmail.com](mailto:sajjadur25@gmail.com) (S. Rehman), [knkalita@gmail.com](mailto:knkalita@gmail.com) (K.K. Kalita), [draparajeetabaruah396@gmail.com](mailto:draparajeetabaruah396@gmail.com) (A. Baruah).

than that of generalized seizure, though this was not confirmed by other studies. Recurrent seizures due to reasons like seizure foci and compliance to antiepileptic drug may increase the risk of a comorbid mental disorder.<sup>7</sup> Also use of antiepileptic drug itself can cause depression adding to the morbidity further.<sup>8</sup>

Recognition of a comorbid psychiatric disorder is hence important for both better control of seizure and better quality of life. The use standardized interview schedules like Structured Clinical Interview Schedule for DSM-IV Axis 1 disorder (SCID-1) used in previous studies can be time consuming for routine clinical use.<sup>6,9</sup> These standardized interview schedules should be more time efficient, reliable, valid and comprehensive. Mini Neuropsychiatric Interview (MINI) is an effort of this type that focuses on current DSM-IV TR/ICD 10 Axis 1 disorders.

The study center caters to a population coming from various parts of the state of Assam and other adjoining north-eastern states of India. Assessing the psychiatric comorbidity will help in further refining the management of persons with epilepsy

The aim of the study is to see the prevalence of psychiatric comorbidity in persons having epilepsy attending to the tertiary mental health facility and to see association of it with the socio demographic and clinical factors present in the study population.

## 2. Materials and methods

### 2.1. Place of study

This is a hospital based cross sectional study that was done in outpatient department of LGB Regional Institute of Mental Health, Tezpur, India. Cases were taken over a period of one year. This is a tertiary level centre that caters to a large population coming from various parts of the state and also adjacent areas of the state covering the whole of north-eastern India.

### 2.2. Ethical consideration

The study was approved by Institutional Ethics Committee. Written informed consent was taken from the study subjects. They were informed about the purpose of the study and were ensured confidentiality. They were also informed about their right to withdraw any point of time during the study and told that their withdrawal from study would not have any impact in the treatment of the condition. Subjects who were diagnosed with any psychiatric disorder was referred to the psychiatric outdoor for consultation.

### 2.3. Sample size and technique

Taking the prevalence of 49% Axis 1 psychiatric disorders in persons with epilepsy from a multicentric study<sup>9</sup> and allowable error of 10%, sample size of 99.96 was reached. The patients taken were registered for Epilepsy Clinic held on each Monday of the week. Every 10th patient registered was taken for the interview till a sample size of 100 patients was reached by.

### 2.4. Inclusion and exclusion criteria

The patients included were in the age group of 18–60 years and diagnosed as having epilepsy as per International League Against Epilepsy (ILAE) criteria.<sup>10</sup> Neuroimaging of brain was done to rule out any structural lesions. Patients with mental retardation, head injury, substance dependence, past history of mental illness prior to onset of seizure disorder were excluded.

### 2.5. Socio demographic and clinical factors

The sociodemographic details of the patients and clinical factors like seizure type, seizure frequency, and duration of seizure, duration and compliance to antiepileptic drugs were taken. The MINI questionnaire which is used to assess major adult Axis 1 psychiatric disorders in DSM-IV TR and ICD 10 was then administered.<sup>11</sup>

### 2.6. Compliance

Compliance means the “extent to which a patient acts in accordance with the prescribed dose and interval of a dosing regimen.”<sup>12</sup> It is retrospective assessment of doses dispensed in relation to the dispensing period, often called as medication possession ratio, MPR, calculated as

$$\text{MPR} = \frac{\text{No. of days supply held during a defined period}}{\text{No. of days during a defined period}} \times 100 \quad [12]$$

**Table 1**

Demographic Characteristics of the study sample N (%).

Gender	
• Male	67(67%)
• Female	33(33%)
Age Distribution	
• 18–30 years	72(72%)
• 31–40 years	15(15%)
• 41–50 years	11(11%)
• 51–60 years	2(2%)
Age (Mean age)	26.61 years (SD = 10.26)
Marital Status	
• Married	43(43%)
• Unmarried	57(57%)
Education	
• Illiterate	14(14%)
• Primary School level	29(29%)
• High School level	56(56%)
• Graduation and above	1(1%)
Occupation	
• Student	5(5%)
• Homemaker	19(19%)
• Unemployed	35(35%)
• Employed	41(41%)
Locality	
• Rural	23(23%)
• Semi urban	74(74%)
• Urban	3(3%)

**Table 2**  
Clinical Characteristics of the study sample, N(%).

Type of Seizure	
• Generalised seizure + Complex partial with secondary generalization	68 (68%)
• Partial Seizure	32 (32%)
Seizure Frequency	
• <10 episodes/year	75 (75%)
• >10 episodes/year	25 (25%)
Duration of Seizure	
• 0–2 years	16 (16%)
• 2–5 years	50 (50%)
• >5 years	34 (34%)
Family h/o Psychiatric Illness	
• Present	4(4%)
• Absent	96 (96%)
h/o Febrile Seizure	
• Present	2(2%)
• Absent	98 (98%)
Medication Status	
• Single Anticonvulsant	85 (85%)
• Poly Anticonvulsant	15 (15%)
Duration of Antiepileptic Drug	
• 0–1 year	36 (36%)
• 1–2 years	22 (22%)
• 2–5 years	38 (38%)
• >5 years	4(4%)
Compliance to Antiepileptic Drug	
• Good	45 (45%)
• Fair	40 (40%)
• Poor	15 (15%)
Psychiatric Comorbidity	
• Present	50 (50%)
• Absent	50 (50%)

**Table 3**  
Pattern of Psychiatric Comorbidity seen in Person with Epilepsy, N(%).

Depression	18(18%)
Dysthymia	7(7%)
Panic Disorder	1(1%)
OCD	1(1%)
GAD	9(9%)
Brief Psychotic Disorder	4(4%)
Psychosis NOS	10(10%)

**Table 4**  
Association of Socio demographic and Clinical Variables with Psychiatric Comorbidity.

Socio demographic and clinical variable	Psychiatric comorbidity present (n)	Psychiatric comorbidity absent (n)	p value (significant p value <0.05)*
Age			1 df= 1
• 18–30 years	37	37	
• >30 years	15	15	
Gender			0.52 df= 1
• Male	35	32	
• Female	15	18	
Marital Status			0.54 df= 1
• Married	20	23	
• Unmarried	32	25	
Education Status			0.73 df= 2
• Illiterate	6	8	
• Primary School level	16	13	
• High School level and above	28	29	
Seizure Type			<0.001* df= 1
• Generalized/complex partial with secondary generalization	25	43	
• Partial Seizure	25	7	
Duration of Seizure			<0.014* df= 2
• 0–2 years	4	12	
• 2–5 years	23	27	
• >5 years	23	11	
Seizure Frequency			< 0.001* df= 1
• <10 episodes/year	29	46	
• >10 episodes/year	21	4	
Medication Status			0.16 df= 1
• Single Anticonvulsant	40	45	
• Poly Anticonvulsant	10	5	
Duration of AED			0.86 df= 2
• 0–1year	19	17	
• 1–2 years	10	12	
• >2 years	21	21	
Compliance to AED			<0.001* df= 2
• Good	18	27	
• Fair	17	23	
• Poor	15	0	

In this study, patients maintaining a MPR score of 90–100% labeled as good compliance, 75–80% as fair compliance and 75% as poor compliance.

### 2.7. Statistical analysis

The statistical analysis of data was done by SPSS version 23.0 (SPSS South Asia Pvt Ltd., Bengaluru, Karnataka, India) and Graph Pad InStat trial software 3.1(USA). Test of significance was seen by chi square test and fisher exact test was applied for correction wherever applicable.

### 3. Results

The study included a total of 100 participants in the age range of 18–60 years. Nearly three-fourth of the study population was less than 30 years of age and the mean age was 26.61 years with standard deviation of 10.26. The profile of sociodemographic distribution is showed in Table 1. Majority of the subjects were male (67%), unmarried (57%), belonged to a semi-urban background (74%), educated up to high school level (56%) and were employed (41%), though the number of unemployed is also high (35%).

Sixty eight percent subjects had a generalized seizure or complex partial seizure with secondary generalization and in one-fourth of the subjects (25%), the seizures were poorly controlled as they were having >10 episodes of seizure a year as shown in Table 2. Only 16% of the subjects had a seizure duration <2years. In most cases there was no past history of febrile seizure or a family history of psychiatric illness. Eighty five percent of the subjects were on single anticonvulsant. Majority of the subjects were maintain on a good to fair compliance to anti epileptic drugs as shown in Table 2. It is seen that 58% of the subjects were on treatment for last 2 years while only 4% on treatment for >5 years.

Psychiatric comorbidity was present in 50% of the subjects. The breakdown of them is shown in Table 3. Depression 18%, psychosis 14% and anxiety disorders 11% were the most common psychiatric comorbidities.

Psychiatric comorbidity observed in the study population was studied for association with age, gender, marital status, educational status, seizure type, duration of seizure, seizure frequency, medication status, duration of AED and compliance to AED. The

evidence for a strong association of psychiatric comorbidity was found with that of seizure type, seizure frequency, duration of seizure and compliance to AED as shown in Table 4. No other significant association was found across any other socio-demographic and clinical variables.

### 4. Discussion

We found that the prevalence of epilepsy is more in the younger age group and among males. Similar finding related to age group has been found in studies done in India and other developing countries.<sup>13,14</sup> A young male is being more economically responsible is frequently referred for treatment or else there will be loss of productivity which may be a reason for such a trend. The educational level and marital status attained by persons with epilepsy is also getting hampered due to the disease process which is limiting them to attain an optimum level of functioning in the society. But no association was seen in our study with respect to presence of psychiatric comorbidity.

We found that psychiatric comorbidity was as high as 50%, seen in 100 subjects who were having epilepsy. The subjects were assessed with MINI diagnostic interview schedule which is based on ICD 10 and DSM IV-TR. The overall psychiatric comorbidity quoted in our study is similar to studies done in India and abroad. A representation of different studies related to psychiatric comorbidity in epilepsy is shown Table 5. Some discrepancies seen with respect to other studies may be attributable to the fact that the place of study is a mental health institute where referral or visits of patients is due to psychological and behavioral problems.

The overall prevalence of mood disorders, 25% was the highest among all the psychiatric comorbidities. Depression at 18% was most commonly found individual psychiatric disorder in the study population. Hospital based samples have reported higher rate of depression (27–58%) than community based studies (9–22%) in population with epilepsy.<sup>5</sup> Psychosis was present in 14% of the study subjects. The prevalence of psychosis in other studies was reported at 2–9%.<sup>21</sup> A higher prevalence of 18% comorbid psychosis in epilepsy was reported by Filho et al., 2007 in a tertiary care, OPD based study using DSM-IV TR criteria.<sup>22</sup> Comorbid anxiety disorder was present in 11% of the subjects. In a review of studies reported 19–25% prevalence of anxiety.<sup>5</sup> The above trends related with lower prevalence of depression & anxiety and a higher prevalence of psychosis than that reported in previous studies can be attributable to two factors – the study area and the background

**Table 5**  
Overview of Studies on Psychiatric Comorbidity in Epilepsy.

Investigator	N (no. of subjects taken)	Instrument Used	Psychiatric Comorbidity
Currie et al (UK, 1971) [15]	666 hospital outpatients	Interview and case notes	29%
Edeh & Toone et al (UK 1987) [16]	88 Outpatients	Clinical Interview Schedule (CIS)	48%
Manchanda et al (1996, Canada) [17]	300 epilepsy candidate for surgery	Present state examination (PSE)	29%
Cyriac et al (2002, India) [18]	106 outpatients	ICD 10 symptom checklist & ICD 10–DCR	42.45%
Jones JE et al (2005, USA) [9] Multicentre trial	174 subjects from 5 tertiary medical centres	Mini International Neuropsychiatric Interview (MINI) and mood disorder module Structured Clinical Interview Schedule (SCID)	49%
Jacob R et al (2010, India) [6]	88 outpatients	Structured Clinical Interview Schedule (SCID) –DSM IV version	28.7%
Amruth G et al (2014, India) [19]	80 outpatients subjects each with epilepsy, asthma and control	Mini International Neuropsychiatric Interview (MINI)	32.5%
Desai S et al (2014, India) [20]	50 subjects with epilepsy planned for surgery	Mini International Neuropsychiatric Interview (MINI)	52%

of the population who are coming for consultation. Majority of the population come from a sub-urban or rural area. It is likely that awareness or the dysfunction associated with mood and anxiety disorders may be lesser than that of psychosis, where behavioral problems are more acute and severe.

There was evidence for strong association of partial seizures, poorly controlled seizure, longer duration of seizure disorder and poor compliance to AED with presence comorbid psychiatric conditions in patients with epilepsy. These findings are in line with previous studies.<sup>6,23–25</sup> Titlic M et al., 2009 cited that in patients with temporal lobe foci, hypometabolism in extratemporal regions increase the vulnerability for depression.<sup>5</sup> Also poorly controlled seizures and longer duration of seizure disorder decrease the functionality and deterioration in quality of life adding further to the psychological morbidity. Poor compliance to anticonvulsants which may lead to poorly controlled seizure which may have a bidirectional relationship with presence of comorbid psychiatric disorder.<sup>26</sup> Such an association needs further clarification.

This study is an attempt to highlight the clinical profile and comorbid psychological problems of patients with epilepsy from north eastern part of India. There are obvious limitations of doing a cross sectional study and a small population but this study has used a scale which is structured and is less time consuming.

## 5. Conclusion

Psychiatric comorbidity in patients with epilepsy are common. Depression, psychosis and anxiety disorder were the most commonly reported problem in the study population. Awareness in the general population is needed regarding psychological issues in patients with epilepsy especially with respect to depression and anxiety disorders which may sometimes go unnoticed. Patients with partial seizure need more attention for psychological issues. Maintaining compliance to anticonvulsants will not only control seizure frequency but also independently reduce the overall comorbidity.

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