

## Management Strategy of Patients Attending at Epilepsy Clinic in a Tertiary Care Hospital of Bangladesh

Mohammad Sayeed Hassan<sup>1</sup>, Md. Shafikul Islam Khan<sup>2</sup>, Paritosh Kumar Sarkar<sup>3</sup>,  
Anwar Israil<sup>4</sup>, Ferdous Ara<sup>5</sup>, Mohammad Ariful Islam<sup>6</sup>, Sheikh Farjana Sonia<sup>7</sup>,  
Junaid Abdul Qayyum<sup>8</sup>, Ariful Islam<sup>9</sup>, Uttam Kumar Saha<sup>10</sup>

<sup>1</sup>Assistant Professor, Department of Neurology, National Institute of Neurosciences & Hospital, Dhaka, Bangladesh; <sup>2</sup>Medical Officer, Department of Neurology, National Institute of Neurosciences & Hospital, Dhaka, Bangladesh; <sup>3</sup>Associate Professor, Department of Neurology, National Institute of Neurosciences & Hospital, Dhaka, Bangladesh; <sup>4</sup>Assistant Professor, Department of Neurology, National Institute of Neurosciences and Hospital, Dhaka, Bangladesh; <sup>5</sup>Professor, Department of Transfusion Medicine, National Institute of Neurosciences & Hospital, Dhaka, Bangladesh; <sup>6</sup>Assistant Professor, Department of Neurology, National Institute of Neurosciences & Hospital, Dhaka, Bangladesh; <sup>7</sup>Assistant Professor, Department of Pediatrics, Institute of Child Health, Dhaka, Bangladesh; <sup>8</sup>Medical Officer, Department of Neurology, National Institute of Neurosciences & Hospital, Dhaka, Bangladesh; <sup>9</sup>Associate Professor, Department of Paediatric Neurology, National Institute of Neurosciences & Hospital, Dhaka, Bangladesh; <sup>10</sup>Professor of Neurology, (In the post of Senior Consultant), Department of Neurology, Apollo Hospital, Dhaka, Bangladesh

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### Abstract

**Background:** Epilepsy is a neuronal disorder that is observed globally but still it is not explored very well in most parts of the world. **Objective:** The aim of our study was to determine the types of epilepsies along with their treatment strategies among patients attending the outdoor epilepsy clinic in a referral tertiary care hospital. **Methodology:** This cross sectional study was carried out from the records of weekly epilepsy clinic of Department of Neurology at National Institute of Neurosciences and Hospital, Dhaka, Bangladesh from January 2018 to August 2019. Data were collected through a predesigned questionnaire containing information about demography, clinical features, EEG and imaging findings and treatment of patients. **Results:** A total number of 1832 patients were recruited. There was a male (55.3%) and urban (61.1%) predominance. Most (75.1%) of the patients were young (age range from 10 to 29 years). A large number of patients were student (44.4%) and 24.2% were unemployed. The duration of epilepsy in most patients were less than 5 years (40.7%). 58.3% patients took various forms of indigenous treatment prior to attending this clinic. 54.7% patients had no comorbid illness. EEG was abnormal in 34.5% patients of which 24.4% had focal abnormality and 10.1% had generalized epileptic discharge. In brain imaging (CT/MRI) only 16.4% showed abnormal findings. 49.5% patients were suffering from generalized epilepsy whereas 44.6% had partial epilepsy. Among the generalized epilepsy group, most of them had generalized tonic clonic seizure (GTCS) (75.4%), while 8.9% had absence seizure and 7.9% had tonic seizure. In partial epilepsy group, the majority were secondary generalized seizure (74.7%), followed by complex partial seizure (CPS) (18.7%) and simple partial seizure (6.6%). 42.7% patients got single antiepileptic drug whereas 37.4% patients received dual drug. Polytherapy (three or more drugs) were prescribed in 14% patients. Valproic acid was the highest prescribed drug (29.3%) either as monotherapy or in combination. Carbamazepine (27.4%) was the second common drug followed by Levetiracetam (15.1%). **Conclusion:** Epilepsy affects almost all groups of the society. Most of the patients remain seizure-free with judicious anti-epileptic drugs. Therefore, more effort is needed for early accurate diagnosis and appropriate treatment of epilepsy. [*Journal of National Institute of Neurosciences Bangladesh, 2020;6(1):3-8*]

**Keywords:** Management Strategy; Epilepsy Clinic; Bangladesh

**Correspondence:** Dr. Mohammad Sayeed Hassan, Assistant Professor, Department of Neurology, National Institute of Neurosciences & Hospital, Sher-E-Bangla Nagar, Agargaon, Dhaka, Bangladesh; Email: [dr.sayeed@yahoo.com](mailto:dr.sayeed@yahoo.com); Cell no.: +8801711442626

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## Introduction

Epilepsy is a chronic neuronal disorder or group of disorders, which is characterized by the recurrent (two or more) epileptic seizures that usually recur unpredictably in the absence of provoking factors. An epileptic seizure is a clinical presentation which is linked to an abnormal and excessive discharge from a set of neurons in a specific locus of the brain. There are an estimated 50 million people with epilepsy in the world, of whom up to 75.0% live in resource-poor countries with little or no access to medical services or treatment<sup>1-3</sup>.

World Health Organization (WHO) estimates that there are at least 1.5 to 2.0 million people with epilepsy in Bangladesh<sup>4</sup>. About half of the total epilepsy population lives in Asia<sup>5</sup>. The risk of having epilepsy at some point in average life span of any individual varies between 2.0 to 5.0%<sup>4</sup>. It has been found that up to 30% of those attending tertiary referral centers with refractory epilepsy do not in fact have epilepsy<sup>6</sup>. Neurologists are better at the diagnosis of epilepsy than non-specialists and the mistake rate is 5.6% and 18.9% cases respectively<sup>6</sup>.

Bangladesh is one of the densely populated countries in the world where many chronic neurological disorders are quite common. Although there is no national statistics yet in the country but there are some hospital based studies that reflect to some extent the situation of epilepsy in Bangladesh. Studies in developed countries shows prevalence rate of about 5 per 1,000 populations whereas in developing countries it is higher<sup>7</sup>. Men are more often affected than female and rural populations are affected more than the urban populations<sup>8</sup>. The etiology varies with age. Birth trauma, birth asphyxia, central nervous system infections are common in neonate and infancy whereas head trauma, brain tumor, stroke, infections are common causes in middle aged and elderly<sup>1</sup>.

The Neurology Department of National Institute of Neurosciences and Hospital, Dhaka, Bangladesh has been providing service to epilepsy patients through specialized outdoor clinic. This epilepsy clinic is the highest referral center in Bangladesh. Therefore, the aim of this present study was to obtain a demographic profile of epilepsy patients attending the outdoor epilepsy clinic and to determine the types of epilepsies along with their treatment strategies.

## Methodology

This cross-sectional study was carried out from the

records of weekly epilepsy clinic of Department of Neurology at National Institute of Neurosciences and Hospital, Dhaka, Bangladesh from January 2018 to August 2019. Patients with history suggestive of seizure disorder attended this clinic. All patients who had been seen in the epilepsy clinic were enrolled into the study. A preformed questionnaire was used containing information on age, sex, habitat, clinical history from patients and observers, examination findings, previous and current medications, result of EEG and imaging studies for data collection. A review of baseline clinical information, EEG reports, other investigations, and follow-up records was performed. An EEG was advised routinely to all patients suggestive of epilepsy. EEG was performed at either first presentation or at any stage during the follow-up period. The findings were grouped into two main categories 'normal' and 'abnormal'. The abnormal EEG was defined as the presence of interictal or ictal epileptiform discharges and/or the presence of abnormal background activity with focal or generalized, slow waves or excessive fast waves, abnormal for the age and state of the patients. EEG abnormalities were considered focal if there was a localized spike and sharp wave discharge or persistent focal slowing. Neuroimaging (MRI, CT scan) were advised for all patients. Epilepsy was diagnosed when there was a history of two or more unprovoked seizures. These were classified with a simplified International League Against Epilepsy classification as generalized epilepsy which included myoclonic seizures, absence seizures, atonic seizures, generalized tonic-clonic seizures, generalized clonic seizures, or tonic seizures; partial epilepsy, which included simple or complex partial seizures, or secondarily generalized seizures<sup>9</sup>. Antiepileptics were prescribed when diagnosis of epilepsy was made by neurologist. Type of drug was chosen considering the efficacy, economic status and side effect profile. Statistical analysis was done by using SPSS version 21.0 for Windows. Assumptions of normality and homogeneity of variance were initially checked.

## Results

A total number of 1832 patients were recruited. The majority of patients attending outdoor clinic were <30 years (10 to 29 years) age group (75.1%). Out of 1832 patients, 1013 were male and 819 were female. There was a slight male (55.3%) predominance (Table 1).

Table 1: Age and Sex Distribution of the Study Population (n=1832)

Variables	Frequency	Percent
<b>Age Group</b>		
10 to 19 Years	762	41.6
20 to 29 Years	613	33.5
30 to 39 Years	306	16.7
40 to 49 Years	95	5.2
≥ 50 Years	56	3.0
<b>Gender</b>		
Male	1013	55.3
Female	819	44.7
<b>Total</b>	<b>1832</b>	<b>100</b>

Urban patients were residing in cities and in municipal corporations. All patients other than from urban areas were called as rural patients. There was urban (61.1%) predominance. A large number of patients were student (44.4%). Many of them were unemployed (24.2%) (Table 2).

Table 2: Residence and Occupation of Patients (n=1832)

Variables	Frequency	Percent
<b>Residence</b>		
Urban	1119	61.1
Rural	713	38.9
<b>Occupation</b>		
Student	815	44.4
House wife	170	9.3
Service	152	8.3
Business	95	5.2
Others	157	8.6
Unemployed	443	24.2
<b>Total</b>	<b>1832</b>	<b>100</b>

However, 1069(58.3%) patients took various forms of indigenous treatment prior to attending this clinic. Furthermore, 1002 (54.7%) patients had no comorbid illness. Mental retardation was the commonest comorbid illness (13.7%) followed by cerebral palsy (7.9%) (Table 3).

The duration of epilepsy in most patients were less than 5 years (40.7%) whereas 35.2% patients were suffering for ≥ 10 years (Table 4).

EEG were done in 1303 patients (71.1%). We could not do EEG in rest of the patients (28.9%). EEG was normal in 51.4% patients and abnormal in 48.6% patients. 34.3% had focal abnormality and 14.3% had generalized epileptic discharge. Brain imaging (CT/MRI) were done in 1079 patients (58.8%). Among them 778 (42.4%) revealed no abnormality. 301

(16.4%) showed various types of abnormal findings (Table 5).

Table 3: Comorbidity and History of Indigenous Treatment among the Study Population (n=1832)

Variables	Frequency	Percent
<b>Comorbid illness</b>		
None	1002	54.7
Mental retardation	251	13.7
Cerebral Palsy	145	7.9
Headache	143	7.8
Psychiatric illness	106	5.8
Hypertension	71	3.9
Others	114	6.2
<b>Total</b>	<b>1832</b>	<b>100</b>
<b>History of Indigenous treatment</b>		
Yes	1069	58.3
No	763	42.7
<b>Total</b>	<b>1832</b>	<b>100</b>

Table 4: Duration of epilepsy (n=1832)

Duration	Frequency	Percent
<5 Years	745	40.7
5 to <10 Years	443	24.1
≥ 10 Years	644	35.2
<b>Total</b>	<b>1832</b>	<b>100</b>

Table 5: EEG and CT/MRI Findings of the Patients (n= 1832)

Variables	Frequency	Percent
<b>EEG finding</b>		
Normal	670	36.6
Focal abnormality	447	24.4
Generalized abnormality	186	10.1
EEG not done	529	28.9
<b>CT/MRI finding</b>		
Normal	778	42.4
Abnormal	301	16.4
CT/MRI not done	753	41.2
<b>Total</b>	<b>1832</b>	<b>100</b>

Among the 1832 patient, 907 (49.5%) was suffering from various form of generalized seizures. 818 (44.6%) had various forms of partial seizure. 107 (5.9%) had no seizure disorder (Table 6). Most of non-epileptic patients were suffering from psychiatric disorders or syncope.

Among the generalized seizure group (n= 907), most of them had GTCS (75.4%), while 8.9% had absence seizure and 7.9% had tonic seizure (Table 7).

Table 6: Types of Epilepsy among the Study Population (n=1832)

Diagnosis	Frequency	Percent
Generalized Epilepsy	907	49.5
Partial Epilepsy	818	44.6
Non epileptic disorder	107	5.9
<b>Total</b>	<b>1832</b>	<b>100</b>

Table 7: Classification of generalized epileptic seizure (n=907)

Seizure type	Frequency	Percent
Generalized tonic clonic seizure (GTCS)	683	75.4
Absence	81	8.9
Tonic	72	7.9
Atonic	19	2.1
Myoclonic	40	4.4
Unclassified	12	1.3
<b>Total</b>	<b>907</b>	<b>100</b>

In partial seizure group (n=818), the majority were secondary generalized seizure (74.7%), followed by complex partial seizure (CPS) (18.7%) and simple partial seizure (6.6%) (Table 8).

Table 8: Classification of Partial Epileptic Seizure (n=818)

Seizure type	Frequency	Percent
Simple partial seizure (SPS)	54	6.6
Complex partial seizure (CPS)	153	18.7
Secondary GS (SGS)	611	74.7
Unclassified	24	2
<b>Total</b>	<b>818</b>	<b>100</b>

Out of 1832 patients, antiepileptic drugs were prescribed in 1725 (94.1%) patients. Antiepileptic drugs were not prescribed in 107 (5.9%) patients as they were not suffering from epilepsy. 783 (42.7%) patients got single antiepileptic drug whereas 685 (37.4%) patients received dual antiepileptic drug. Polytherapy (three or more drugs) were prescribed in 257 (14%) patients (Table 9).

Table 9: Number of antiepileptic drugs prescribed (n= 1832)

Number of antiepileptic drug	Frequency	Percent
None	107	5.9
1	783	42.7
2	685	37.4
≥3	257	14.0
<b>Total</b>	<b>1832</b>	<b>100</b>

Valproic Acid was the highest prescribed drug (29.3%) either as monotherapy or in combination with other antiepileptic drugs. Carbamazepine/ Oxcarbazepine (27.4%) was the second common drug followed by newer antiepileptic drug Levetiracetam (15.1%) (Table 10).

Table 10: Name of antiepileptic drugs prescribed (either as monotherapy or in combination)

Name of drug	Frequency	Percent
Valproic Acid	537	29.3
Carbamazepine/Oxcarbazepine	501	27.4
Levetiracetam	276	15.1
Benzodiazepine	212	11.6
Phenobarbital	133	7.3
Lamotrigine	98	5.4
Phenytoin	71	3.9
Others	30	1.6

## Discussion

The most common age of presentation of epilepsy was <30 years (75.1%) in this study. This result coincides with findings of Mannan et al<sup>8</sup> in Bangladesh which is 16 to 31 years. In a study, Sridharan and Murthy<sup>10</sup> showed similar findings with the onset of epilepsy reported mostly in the first three decades of the sample population's lives. Mac et al<sup>11</sup> showed a bimodal age distribution of epilepsy patients in developed country with a first peak in childhood and another one in old age. Except for Shanghai in China, most of the Asian countries have younger epileptic patients<sup>11</sup>. The probable reason for the missing peak in the older age group in many Asian countries is due to the fact that most of the population are younger compared to number of old people<sup>11,12</sup>.

Here a male predominant (55.3%) picture is seen. Similar to reports from other Asian countries, there was slightly male predominance<sup>13</sup>. Epilepsy is slightly more common in men than in women but the sex-specific prevalence is not, in general, significantly different<sup>11</sup>. Reports are similar in other Asian countries<sup>13</sup>. Many studies report a higher incidence in males than female in both developed and developing countries<sup>14</sup>. The difference in incidence may be due some sex hormones which has some association with epilepsy. It is proved scientifically that two female sex hormones (estrogen and progesterone) affect the threshold of seizure to some extent which lead to differences in gender<sup>15,16</sup>. In this study there is slight urban predominance (53%). A meta-analysis of published and non-published community-based studies in India showed a higher prevalence rate of epilepsy of 5.5 per 1000 (95% CI

4.0-6.9) in rural areas than that of 5.1 per 1000 (3.5-6.7) in urban areas<sup>10</sup>. Again in some studies it is also found that urban men and women had a higher prevalence of epilepsy compared with rural ones, however the difference was not statistically significant<sup>8</sup>.

The highest number of patients were student (44.4%), followed by unemployed (24.2%). The report coincides with Mannan et al. [15] (16-31 years) in Bangladesh<sup>7</sup>. The students came to epilepsy clinic as they are the knowledgeable group of society who have an easy access to a tertiary health care system. They draw attention through their teachers and fellows and also the parents are more concerned with the illness of their kids.

However, 58.3% patients took indigenous treatment prior to or concomitant with medical treatment. Superstitious belief about epilepsy is a strong barrier for total care of patients with epilepsy. The epilepsy patients are often reluctant to seek advice from physicians. A previous study showed that close to 70% of patients visited indigenous medicine practitioners, exorcists, spiritualists prior to consulting the clinic<sup>7</sup>.

Most of the patients (59.3%) had history of epilepsy for  $\geq 5$  years. This is because patients came to this referral hospital from various parts of the country who were not responding to treatment for many years. Patients with epilepsy often have other medical illnesses, of which hypertension and diabetes are commonly observed comorbidities in these patients<sup>17</sup>. In this study 1002 (54.7%) patients had no comorbid illness. Mental retardation was the commonest comorbid illness (13.7%) followed by cerebral palsy (7.9%). The difference of finding is probably because most of our index population was younger. Previous study in Bangladesh also found higher frequency of mental retardation (13.7%), cerebral palsy (5%) which is similar to our finding<sup>18</sup>.

In a previous study in Bangladesh it has been found EEG the abnormalities in 48.7% cases of which 23.7% cases showed focal epileptic discharge; 10.5% cases showed generalized epileptic discharge; 13.2% cases showed focal or generalized slowing and 51.0% cases were normal<sup>19</sup>. In our study, EEG were done in 1303 patients (71.1%). EEG was normal in 51.4% patients and abnormal in 48.6% patients. 34.3% had focal abnormality and 14.3% had generalized epileptic discharge. In another study in Bangladesh, EEG was done in 1386 patients. Among them, 36% had abnormal EEG findings<sup>18</sup>.

Brain imaging (CT/MRI) were done in 1079 patients

(58.8%). Among them 778 (42.4%) revealed no abnormality. 301 (16.4%) showed various types of abnormal findings. A previous study among epilepsy patient found 61.5% various types of abnormality in MRI and 50% in CT scan of brain<sup>19</sup>. In another study CT scan abnormality was present in 10% patients while MRI was found abnormal only in 2% patients<sup>18</sup>.

Among 1832 patient, clinically 907 (49.5%) was suffering from various form of generalized seizures. 818 (44.6%) had various forms of partial seizures. This is similar to the reports from most of the Asian countries, where the IGE ranges from 50-69% and partial seizure from 31-50%<sup>20-21</sup>. Eight incidence studies performed in developing countries, particularly in Africa, reported a greater proportion of individuals to have epilepsy characterized by generalized onset seizures than epilepsy characterized by partial seizures<sup>15,22</sup>. But in a hospital based study in Srilanka, Senanayake classified 59.7% patients as secondary generalized seizure<sup>23</sup>. Several series of studies from Liberia, Mumbai, Madras, Brazil reported the frequency between 40-50%<sup>23,24</sup>. Earlier study of Bangladesh showed a high frequency of partial epilepsies which was 54.0%<sup>18</sup>.

In this study, among the generalized seizure group (n=907), most of them had GTCS (75.4%), while 8.9% had absence seizure and 7.9% had tonic seizure. A previous hospital based study showed among generalized seizure patients, the majority being GTCS (70%), the frequency of Absence seizure was 12%, Tonic seizure 8.0%. Only 2.0% patients had Myoclonic seizure<sup>18</sup>. In partial seizure group (n=818), the majority were secondary generalized seizure (74.7%), followed by complex partial seizure (CPS) (18.7%) and simple partial seizure (6.6%). Earlier study of Bangladesh showed among the LRE group highest number of patients had secondary generalized seizure (63.0%). Frequency of CPS and SPS were comparatively lower (21.0% and 11.0%)<sup>18</sup>.

Monotherapy has been the gold standard of epilepsy treatment for many years. Various first generation AEDs are widely used as monotherapy in most of the Asian countries<sup>25-28</sup>. A series of trials by Reynolds and Shorvon also showed similar effectiveness with monotherapy<sup>29</sup>. In this study, 42.7% patients received single antiepileptic drug while 37.4% dual and 14% three or more antiepileptic drugs. In a previous study done in a tertiary care hospital in Bangladesh, the number of patients on monotherapy and dual AED therapy were 67.0% and 24.0% respectively and polytherapy (i.e. >3 AEDs) was used only in 9.0%<sup>30</sup>.

The number of polytherapy was higher in our study because most patients referred to this hospital were not responding to treatment with monotherapy for years.

In this study, Valproic acid was the highest prescribed drug (29.3%) either as monotherapy or in combination with other antiepileptic drugs. Carbamazepine (27.4%) was the second common drug followed by Levetiracetam (15.1%) and Benzodiazepines (11.6%). In a previous study done in a tertiary care hospital in Bangladesh, Carbamazepine (67.0%) was the most frequently prescribed AED, followed by valproic acid (43.0%), Phenobarbital (17.0%), and Phenytoin (8.0%). Carbamazepine was prescribed in 37.0% patients as monotherapy followed by Sodium valproate in 21% and Phenobarbital in 8.0% patients. Newer generation drugs - lemotrigine and topiramate were used only as add on therapy in combination with CBZ and VPA in only 2% patients<sup>30</sup>.

### Conclusion

Epilepsy is a significant health problem in Bangladesh but it is still not properly out of shadow. Most of the patients are young and a significant portion of them are unemployed. It takes several years for a patient to consult with a neurologist. Detailed history, clinical examination and routine EEG and imaging studies have helped in classifying many of the previously undiagnosed seizures. Most of the patients remained seizure-free with commonly used anti-epileptic drugs. So more awareness about epilepsy is needed for early detection and treatment of this troublesome illness.

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