Epilepsy Patients in Bangladesh - The Experience of a Referral Hospital

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Abstract:

*Purpose: To analyze the socio-demographic and electro-clinical data of Epilepsy patients presenting in the 'Epilepsy Clinic' of a referral hospital. **Method**: Epilepsy patients came to this weekly clinic after referral from this hospital OPD, other hospitals and from private practitioners. All the patients were enrolled from November, 2012 to December, 2015. Then clinical diagnosis was established by the chief investigator. Routine EEG was done. MRI was advised in appropriate cases. Finally the clinical findings and investigation reports were correlated. **Results**: Among 331 patients, 63% were male and 37% were female. 86% patients were in the younger age group (0-29years). 75% patients were suffering from various forms of LRE, 19% from Generalized Epilepsy Syndrome, 2.7% were unclassified and 2.7% had pseudo-seizure. Total 224 EEG could be done. Among them 118 (52.7%) had different types of abnormalities. Among total 158 MRI, 120 (76%) were abnormal. 6.3% patients could not go to school, 3.3% left study and 12.7% patients remain unemployed due to the disease burden. **Conclusion**: This is a hospital based study. In this study LRE comprises 75% of total patients which is relatively higher than other reports. Males were predominating and younger people were affected more with epilepsy. Due to this disease various social problems were occurring regarding study and employment. This result demands community based larger study in our country.*

Introduction:

Epilepsy is the commonest neurological condition affecting people of all ages, race and social class. There are an estimated 50 million people with epilepsy in the world, of whom up to 75% live in resource-poor countries with little to or no access to medical services or treatment[1,2].

Epilepsy is clinically similar in developing and developed countries, but the extent to which patients with epilepsy are recognized, investigated, and managed is different. Epidemiology, etiology, socio-cultural, and economic factors all contribute to these differences[3].

Diagnostic accuracy is a particular problem in epilepsy as seizures are a symptom of diverse underlying cerebral etiologies and usually do not have any physical manifestations. Consequently a definitive diagnosis of epilepsy is often only made after an extended period of follow up, as evidenced in the Rochester study and the National General Practice Study of Epilepsy (NGPSE), a community-based study of epilepsy in the United Kingdom. Moreover it has been found that 20-30% of those attending tertiary referral centers with refractory epilepsy do not in fact have epilepsy, with the most common differential diagnoses being dissociative seizures and syncope. As expected, neurologists are better at the diagnosis of epilepsy than non-specialists (mistake rate 5.6% vs. 18.9%), but a misdiagnosis rate of 5% should be considered as the absolute minimum[4].

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Many people with epilepsy may not come to medical attention, either due to ignorance or lack of awareness of the symptoms. This is particularly true of absence and minor complex partial seizures, which may only be recognized in retrospect following presentation with a generalized seizure. Indeed in one study of general practices only 20% of patients with seizures suspected the diagnosis prior to medical consultation[4].

In Bangladesh epidemiological surveys confirm that seizure disorders are common. A study showing prevalence rate of 68 out of every 1000 for 'any seizure history' and 9 out of every 1000 for 'any unprovoked seizure', in children aged 2 to 9 years. However, there is very little information on the types of epilepsy or on their clinical presentations, EEG records, or clinical outcomes. These are important for planning management and for developing wider services within the country[5].

Bangladesh is one of the densely populated countries in the world where infectious diseases, malnutrition and 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. Men are more often affected than female and rural populations are affected more than the urban populations[6]. Based on the prevalence rate of 10 per 1,000 populations it is estimated that out of 160 million, there are at least 1.6-2.0 million people with epilepsy in Bangladesh[7]. The common ages of epileptic patients in Bangladesh are between 16 to 31 years. 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. Vast majority of the people in Bangladesh does have superstitious belief about Epilepsy. This belief usually is a strong barrier for total care of patients with epilepsy. Misunderstanding and negative attitude of the parents, family members and society towards epilepsy are still prevalent. Thus, many patients with epilepsy are still neglected in diagnosis, treatment, education, rehabilitation and other social needs. The epilepsy patients are often reluctant to seek advice from physicians. Rather they believe epilepsy has no cure and they seek advice from indigenous medicine practitioner *'Kabiraj',* snake charmer *'Ojha'* and spiritual healers. A report of 130 patients from the epilepsy clinic of BSMMU (a government post-graduate medical center) showed that close to 70% of patients visited indigenous medicine practitioners, exorcists, spiritualists prior to consulting the clinic, only 29% perceived epilepsy as a disease, 50% dropped out from school (58% of whom due to epilepsy), and 52% of patients had to change job because of epilepsy. Appropriate antiepileptic drugs are sometime unavailable in Bangladesh. The BSMMU study showed 23% of patients found it difficult to continue treatment due to financial problem. Financial factor is likely to partly accounts for the drug non-compliance[7].

The aim of our study was to obtain a baseline profile of epilepsies, to determine the types of epilepsies and epileptic syndromes in patients attending the outdoor epilepsy clinic in a tertiary care hospital and to compare the data with other centers of this country and rest of the world.

Materials and Methods:
This is an observational study carried out from records in weekly Epilepsy outdoor clinic of Department of Neurology, Shaheed Sheikh Abu Naser Specialized Hospital, Khulna (a government specialized hospital) from November 2012 to December, 2015. This is the only center in this division (comprising 10 districts and 15,563,000 inhabitants)[8] which is providing such type of facilities. So patients are referred from all over the division. They are consulted free of cost. During this period a total of 331 patients with history of seizure disorder attended the clinic. All patients who had been seen consecutively in the epilepsy clinic were retrospectively enrolled into this study. There is a case record proforma for every patient attending the clinic which contains all relevant information and findings. 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 from hospital records. A review of baseline clinical information, EEG reports, other investigations, and follow-up records was performed. If the information was insufficient, a further follow-up review was undertaken by recalling the patients and the care-givers by telephone calls[9].

EEG: An EEG is advised routinely to all patients. EEG was performed at either first presentation or at any stage during the follow-up period. The EEG was obtained with a 32–channel digital machine with the electrodes placed in accordance with the International 10–20 system. In most cases recordings were obtained in both the awake and sleep states for 30-40 minutes. Photic stimulation and hyperventilation were routinely done. The EEGs were interpreted and reported by the chief investigator.

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 background abnormal activity with focal or generalized, excessive slow waves or excessive fast waves, abnormal for the age and state of the patients noted during the recording. The abnormal was further classified as FED (Focal Epileptiform Discharge), GED (Generalized Epileptiform Discharge) and Others (Focal or generalized slowing, multi-focal epileptiform discharge with burst attenuation pattern). EEG abnormalities were considered focal if there was a localized spike or sharp wave discharge or focal slowing present.

Other investigations like 'MRI of Brain' was advised for all patients clinically diagnosed as suffering from LRE, symptomatic generalized epilepsy, most patients with late onset epilepsy and also for patients with clustered seizures, frequent seizures, isolated seizures, intractable epilepsy, and patients who had unexplained break-through seizures in otherwise well-controlled epilepsies. Routinely CT scan was not advised. But patients presenting with a CT done previously were documented. The available films were interpreted jointly by the radiologist and the investigator (as there is no epilepsy expert radiologist in this institute). All clearly abnormal focal

lesions (e.g., tumour, infarct, gliosis, atrophy) revealed on CT and magnetic resonance imaging (MRI) scans of the brain were documented.

Diagnosis and classification of epilepsy: 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 (ILAE 1989, 1993)[10,11] as: (a) generalized epilepsy, which included myoclonic seizures, infantile spasms, absence seizures, atonic seizures, generalized tonic–clonic seizures, generalized clonic seizures, or tonic seizures; (b) partial epilepsy, which included simple or complex partial seizures, or secondarily generalized seizures; and (c) unclassifiable seizures, which were atypical or those in which the children were not sure whether their seizure were focal or generalized in presentation[10-13].

By using standard clinical and investigation criterions (ILAE 1989, 1993) epilepsy was further classified as 'symptomatic' if there was a clear antecedent history (e.g., significant head trauma, CNS infection) and when a structural lesion was documented on neuroimaging and 'idiopathic' if there was no such evidence of a cerebral lesion. Patients with recurrent seizures, and with clinical or EEG evidence of focal onset but no evidence of causation were included under 'cryptogenic' localization related epilepsy. Epileptic disorders with mental retardation and frequent seizures which lacked the characteristic features of the defined syndromes were included under "other symptomatic generalized epilepsies not defined"[10, 11].

Partial seizures were further sub-classified chiefly on the basis of whether or not consciousness was impaired during the attack and whether or not progression to generalized convulsions occurred.

A. Simple partial seizures (when consciousness not impaired).

B. Complex partial seizures (when consciousness was impaired).

C. Partial seizures (simple or complex) evolving to secondarily generalized (tonic–clonic or tonic or clonic) seizures.

Complex partial seizures were further sub-classified chiefly on the basis of involvement of temporal lobe or not:

1) Complex partial seizures-Temporal (CPS-T)

2) Complex partial seizures-Extra-Temporal (CPS-ET)

Temporal lobe epilepsy was diagnosed if the history, seizure semiology, EEG and/or imaging showed evidence in favor of seizure originating over the temporal lobes. Rest of the CPS cases which did not fit to temporal lobe origin or showed evidence of origin over other parts of brain, were considered to be CPS Extra-Temporal (CPS-ET).

As in the International League Against Epilepsy classification (ILAE 1989, 1993) there is no special entity for 'Status Epilepticus' or 'Epilepsia Partialis Continua'(EPS), the cases of EPC have been included in the partial seizure group. As all the patients were referred to this 'Epilepsy Clinic' by various physicians, the patients whose history were not convincing enough to fit for seizure, were considered to be suffering from 'Pseudo-Seizure' and the data was included in the study so that the real picture of our patients come to light.

Result:

These were 331 patients were included in this study and out of them 123(37.166) were female and 208(62.84%) were male. The majority of patients attending outdoor clinic were <30 years age group (86%) (Table-I). There was a male (62.8%) predominance (Table-II). A large number of patients were student (35%), followed by preschool child (14.8%) (Table-III).

Table-I
Age distribution of patients (n=331)

Age Group	Number of Patient	Percentage
0-9 yrs	99	29.9
10-19 yrs	123	37.2
20-29 yrs	62	18.7
30-39 yrs	22	6.7
40-49 yrs	17	5.1
>50 yrs	08	2.4
Total	331	100.0

Table-II
Sex distribution of patients (n=331)

Male	208	62.84
Female	123	37.16
Total	331	100.0

Table-III
Sex distribution of patients (n=331)

Occupation of the patients	Number of Patient	Percentage
Non-school	21	6.3
Pre-school	49	14.8
Left school	11	3.3
Student	116	35.0
House wife	31	9.4
Business	15	4.5
Service	19	5.8
Unemployed	42	12.7
Others	27	8.2
Total	331	100.0

Table-IV
Types of Seizure & their distribution (n=331)

Seizure Type	Frequency	Percentage
LRE	249	75.3
Gen. Epilepsy	64	19.3
Unclassified	08	2.4
Pseudo-Sz	09	2.7
Total	331	100.0
Findings	Frequency	Percentage
Normal	106	47.3
FED	79	35.3
GED	22	9.8
Others	17	7.6
Total	224	100.0

Table-V
Distribution of occupation of patients (n=331)

Seizure Type	Frequency	Percentage
Focal Motor Seizure	5	1.5
CPS-T	112	33.8
CPS-ET	27	8.2
Partial Seizure with secondary generalization	102	30.8
EPC	2	0.6
BRE	1	0.3
Symptomatic Generalized Epilepsy	39	11.8
Sturge Weber Syndrome	1	0.3
Tuberous Sclerosis Complex	2	0.6
IGE	13	3.9
CAE	4	1.2
JME	3	0.9
JAE	1	0.3
Gelastic Seizure	1	0.3
SSPE	1	0.3
Unclassified	8	2.4
Pseudo-Seizure	9	2.7
Total	331	99.9
(Reflex seizure)	5	

Table-VI
EEG findings of the patients

Findings	Frequency	Percentage
Normal	38	24
Abnormal	120	76
Total	158	100

Table-VII
CT scan findings of the patients

Findings	Frequency	Percentage
Normal	106	47.3
FED	79	35.3
GED	22	9.8
Others	17	7.6
Total	224	100.0

Table-VIII
MRI findings of the patients

Findings	Frequency	Percentage
Normal	6	27.3
Abnormal	16	72.7
Total	22	100.0

Among the 331 patients, 75% had been suffering from various forms of localization related epilepsy (LRE), 19% from generalized epilepsy, 2.4% were unclassified and 2.7% from pseudo-seizure (Table-V). 11.8% patients had been suffering from symptomatic generalized epilepsy (most of them were child and had history of perinatal asphyxia and head injury), 2 patients were found to have Tuberous sclerosis complex, 1 patient was found to have Sturge Weber syndrome and 1 patient was diagnosed as SSPE and 3.9% patients had IGE (Table-VI). Five patients were identified to have reflex seizures. The seizures were precipitated by eating, sound and light. But these patients have primary features suggestive to be included in other classifications of epilepsy like CPS-T, CPS-ET and IGE (Table-VI). So they are not showed in the main sub-groups of epilepsy. EEG could be done in 224 patients. Of them 35.3% showed FED, 9.8% showed GED, 7.6% showed focal or generalized slowing or multi-focal epileptiform discharge with burst attenuation pattern and 47.3% were normal (Table-6). Among total 158 MRI, 76% showed various types of abnormal findings and among total 22 CT Scan 72.7% were abnormal (Table-VII, VIII).

In figure 1, a young patient of 14 years presented with the history of 'Partial Seizure with secondary generalization'. He had been suffering from 'Ventricular Septal defect with Reverse Shunt'. His EEG shows Focal Epileptiform Discharge (FED) over right fronto-centro-temporal region. His MRI shows abscess over the same area of brain. Figure 2 shows 2 cases of Temporal Lobe Epilepsy, 'a' shows FED over left anterior temporal (CPS-T-Lt.) and 'b' shows FED over right posterior temporal area (CPS-T-Rt.). In figure 3, the patient presented with Simple Partial Seizure– Left sided. His EEG was normal, MRI showing

tuberculoma over right parietal area. Figure 4 patient presented with the features of Cerebral Palsy and Complex Partial Seizure – Extra-Temporal. His EEG shows FED over left posterior head region. MRI also shows gliosis over the same area with left sided cerebral atrophy. The patient in figure 5 presented with CPS. He had mental retardation and adenoma sebaceum. He was diagnosed as Tuberous Sclerosis with CPS. His CT scan of brain shows tubers. The patient in figure 6 presented with repeated drop attacks, poor mental condition. His EEG shows runs of spike and slow wave discharge at 1-1.5 Hz (Status of Atypical Absence Seizure). His MRI showing bilateral gliosis (Rt.>Lt.) with right sided cerebral atrophy. These features are consistent with Symptomatic- LGS. In figure 7 the EEG of 13 month child showing multi-focal Epileptiform discharge with burst attenuation pattern which is suggestive of Epileptic Encephalopathy. In figure 8 a child of 8 years showing Spike and wave discharge at 3 Hz during which she was unresponsive which is a classical feature of Absence Seizure.
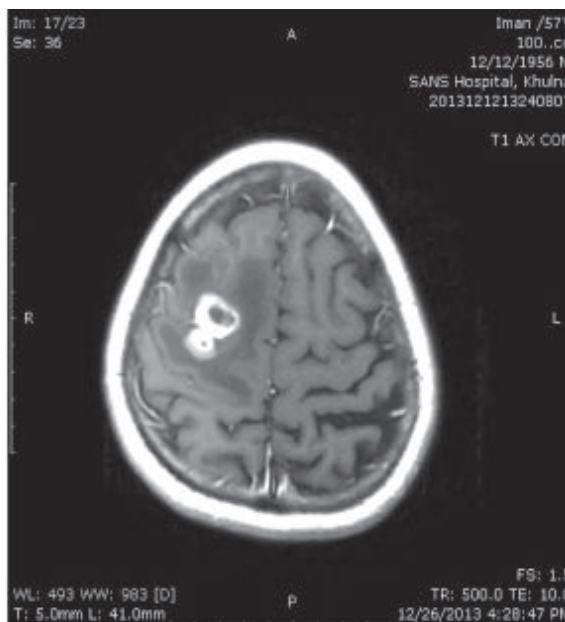

| A | B | C |
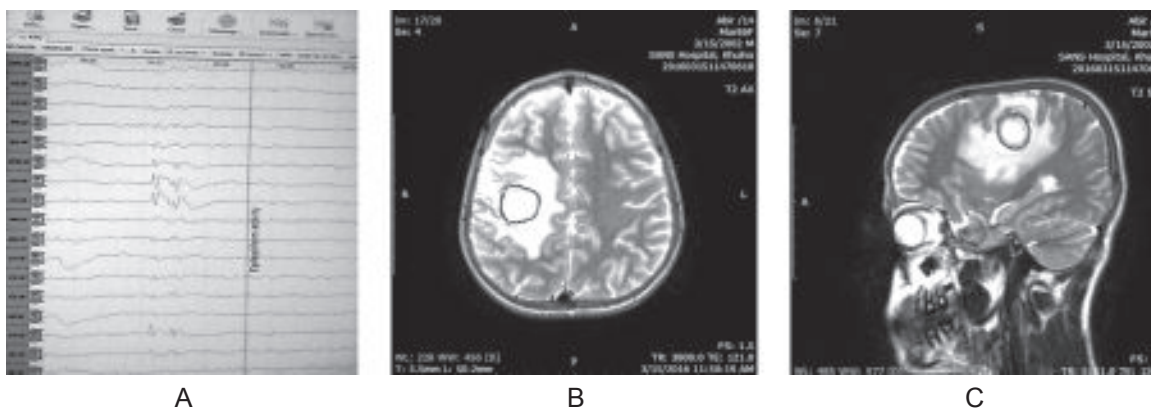
Fig.-1: *Abir, 14y: A-EEG - FED-Rt-Fronto-Centro-Temporal, B- MRI (b-Axial, c-sagital view) = Brain Abscess over right frontal lobe*
DIAGNOSIS = Partial Sz. with secondary generalization due to Brain Abscess +
VSD with reverse shunt.

| A | B |
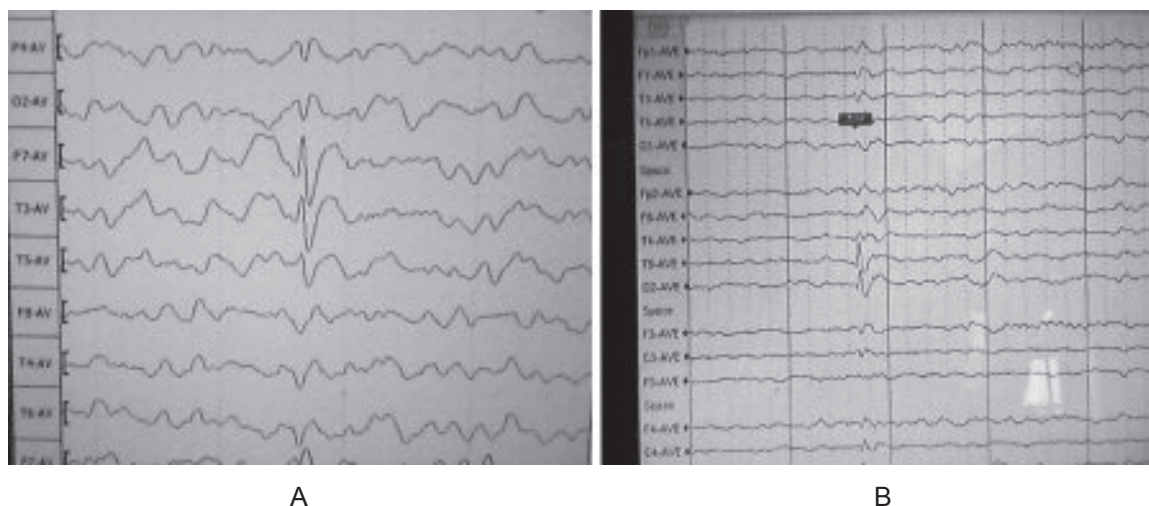
Fig.-2: *EEG of Temporal Lobe Epilepsy. a = Left Anterior Temporal Spike,*
b = Right Posterior Temporal Spike
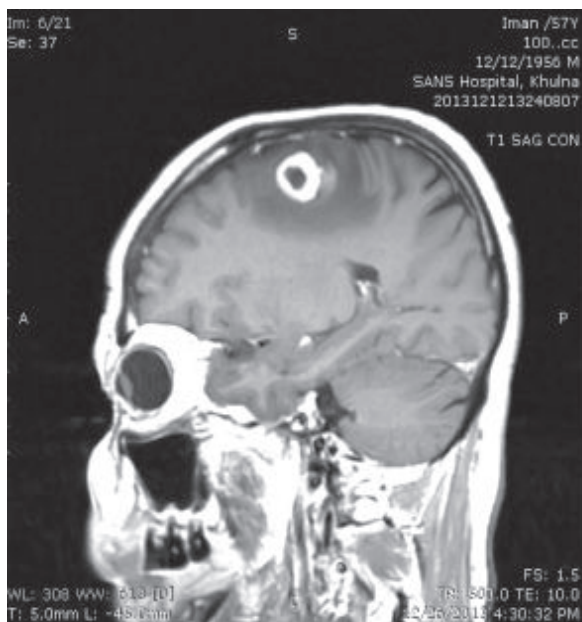
A   B
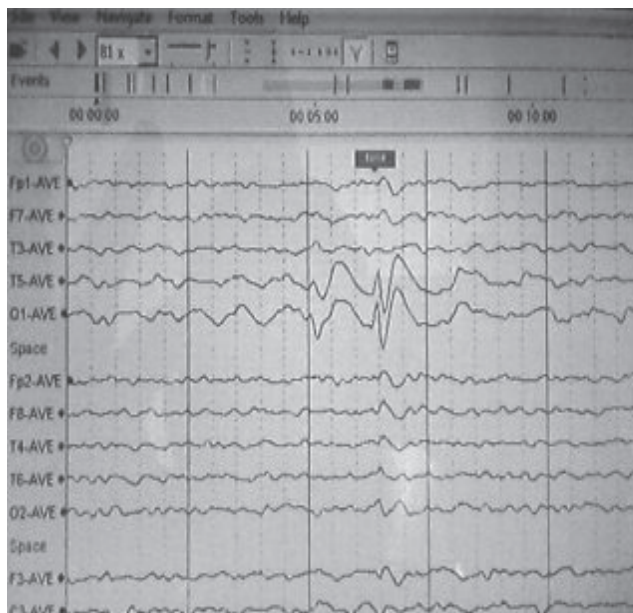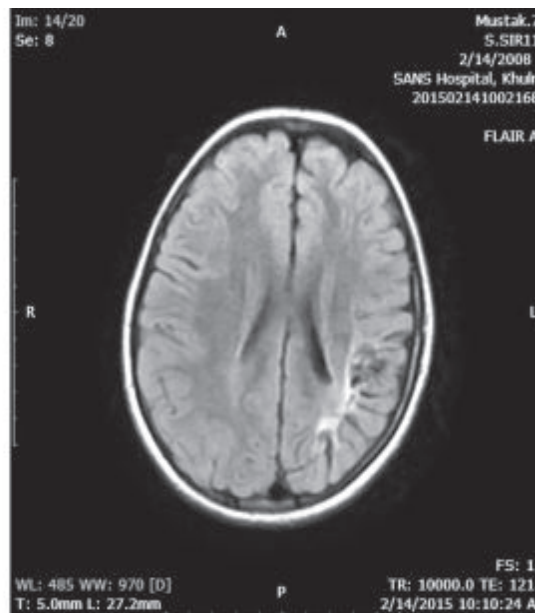
Fig.-3: *Iman, 57Y - MRI of Brain (a-Sagital, b-Axial view) = Tuberculoma Diagnosis = Simple Partial Seizure due to CNS-TB*
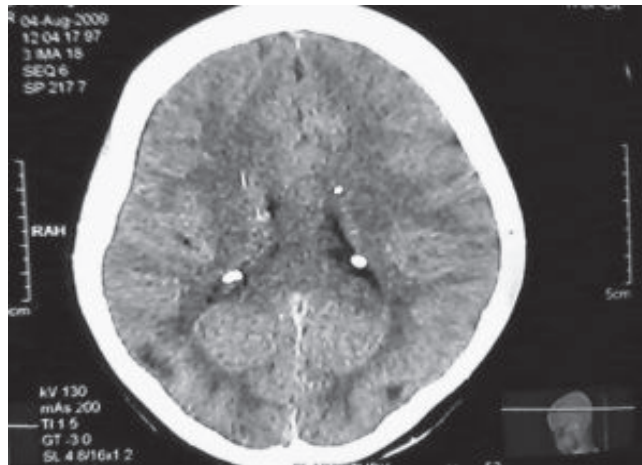

A   B

Fig.-4: Mustak, 7y *a) EEG = Focal Epileptiform Discharge over left posterior head region with delta slowing   b) MRI of Brain = Gliosis & Atrophy (Left Parieto-Occipital) Diagnosis = Cerebral Palsy + Complex Partial Seizure –Posterior Head Region*

Fig.-5: *CT Scan of Head (Tubers): Mominul, 18Y Diagnosis = Complex Partial Seizure due to Tuberous Sclerosis Complex*
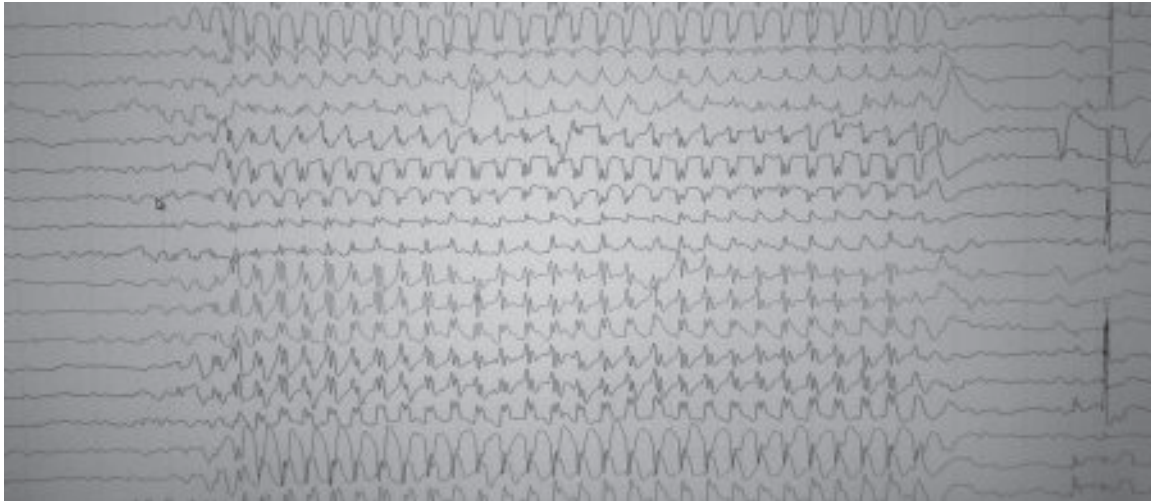

Fig.-6: *Nahid, 6y: a) EEG= Atypical Absence Seizure (Status). b) MRI of Brain= Bilateral gliosis (Rt.>Lt.) & Right Cerebral Atrophy; sequele of Encephalitis at age 4y.   Diagnosis = Lennox-Gastaut Syndrome*

Fig.-7: *Siam,13m - Multi-focal epileptiform discharge with Burst Attanuation pattern Diagnosis = Symptomatic Generalized Epilepsy with Epileptic Encephalopathy*

Fig.-8: *Khadiza, 8y: EEG= Generalized Spike and dome discharge at 3 Hz (Absence Sz.)*

Discussion:

Based on the findings of this study several issues demand attraction. The most common age of presentation of epilepsy was <30 years (86%). In a study done by Sridharan and Murthy[14], similar findings was seen; 'age-specific prevalence rates were higher in the younger age group, with the onset of epilepsy reported mostly in the first three decades of the sample population's lives'. Except for Shanghai in China, most of the Asian countries have younger epileptic patients. The probable reason for the missing peak in the older age group in many Asian countries is due to the fact that the population in general is younger[15].

Here a male predominant (62.84%) picture is seen. Epilepsy is slightly more common in men than in women but the sex-specific prevalence is not, in general, significantly different.[15] Reports are similar in other Asian countries[16]. Although our country has almost same socio-economic condition like the surrounding countries (India and Pakistan) here women are more home bound and neglected. Regarding epilepsy various social stigma remains. So people try to hide the illness of their daughters and sisters. As males are more exposed to outer world, their diseases come to the attention easily and people bring them to doctors. Also, as they are the earning members, their illness gets more importance for the uninterrupted continuation of earning source.

The students (35%) came to epilepsy clinic as they are the knowledgeable group of society who has 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.

Regarding distribution of seizures 75.3% patients are suffering from various forms of LRE. Studies from India also recorded a high frequency of partial epilepsies: 62.9%,[17] and 57%[18]. Data in other developing[19-22] and developed countries shows same finding[23]. Earlier study of Bangladesh also showed a high frequency of partial epilepsies: 54%[24].

In this study Partial seizure with Secondary generalization comprises 41% which appears to be relatively more than other's findings. These patients usually present with convulsion and draw attention of the attendants and physicians early. Many patients showed lesions (gliosis, atrophy in MRI) in occipital and posterior head region which indicates birth injury, asphyxia and trauma which may be the reason for increased number of these patients in this area.

Although few patients were ultimately diagnosed as having pseudo-seizure, this issue should be taken into account as all of them were getting anti-epileptic drugs along with all the restrictions and burden of epilepsy.

EEG findings were positive in almost 52.7% cases. This also matches with the findings of other authors[25].

There are some limitations in the study. We could not apply the recent ILAE proposal for classification of epilepsy syndrome. The study from hospital records may not completely represent the scenario in the community. Finally, also due to the retrospective nature, some aspects like the attitude of patients and attendants to epilepsy, the real burden of the disease on the family and society could not be evaluated.

Conclusion:
This study highlights some facts. Localization Related Epilepsy are more common in our country. Facilities should be improved to identify the etiology and provide extra care to reduce the burden. This is a hospital based study. Males are predominating and younger people are affected more with epilepsy. Due to the disease various social problems are occurring regarding study and employment. This result demands community based larger study in our country.

Declarations:
Funding: This research project was not funded by any group or any institution.

Ethics: The study protocol was approved by institutional ethical committee of Shaheed Sheikh Abu Naser Specialized Hospital, Khulna, Bangladesh

Data Sharing: There is no other unpublished data to share.

Conflict of interest: There is no conflict of interest relevan1t to this paper to disclose.

Abbreviation :
BRE = Benign Rolandic Epilepsy
BSMMU = Bangabandhu Sheikh Mujib Medical University
CAE = Childhood Absence Epilepsy
CPS = Complex Partial Seizure
EPC = Epilepsia Partialis Continua
FED = Focal Epileptiform Discharge
GED = Generalized Epileptiform Discharge
IGE = Idiopathic Generalized Epilepsy

JAE = Juvenile Absence Epilepsy
JME = Juvenile Myoclonic Epilepsy
LGS= Lennox Gastaut Syndrome
LRE = Localization Related Epilepsy
OPD = Out Patient Department
PHR= Posterior Head Region
SSPE= Sub-acute Sclerosing Pan Encephalitis

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