

ORIGINAL RESEARCH

Clinical Profile of Young Onset Epilepsy - An Observational Study in a Tertiary Care Hospital in Eastern India

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ABSTRACT

Background: Epilepsy describes a condition in which a person has a risk of recurrent seizures due to a chronic, underlying process. Today people with epilepsy are confronted with an array of confusing, but often effective, treatments. The purpose of the present study is to observe the type of epilepsy in young onset epilepsy patients admitted in or attending R. G. Kar Medical College and Hospital, Kolkata. **Methods:** This was an hospital based descriptive, observational study, conducted at Department of General Medicine and Department of Neuro- medicine, R.G. Kar Medical College & Hospital, Kolkata, West Bengal, India, from January 2021 to June 2022. A **sample size of 127** were considered for this study after meeting the inclusion and exclusion criteria. Data were entered into a Microsoft excel spreadsheet and then analyzed by SPSS (version 24; SPSS Inc., Chicago, IL, USA). **Result:** The mean age of the patients is found to be 34.3 ± 10.4 years where as the age of onset of the disease is 26.1 ± 6.5 . 54.3% of the patients is male and 45.7% is female. In the present study 59.06% of the patients experienced generalized onset epilepsy while 40.94% of the patients experienced focal onset epilepsy. In MRI examination 44.9% of the cases were found to have abnormal and 55.1% cases were found to have normal findings. EEG examination was abnormal in 68.15% of the cases and normal in 31.5% of the cases. 81.15% of male and 75.86% of female patients are found to have good drug compliance. **Conclusion:** Incidence of generalized onset epilepsy shows a falling trend and focal onset seizure shows the reverse trend as the age advances and males are more affected than female.

Key words: Clinical profile, convulsion, epilepsy, seizure

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INTRODUCTION

Epilepsy is a disorder of the brain. It has been defined as paroxysmal involuntary two or more unprovoked seizures occurring 24 hours apart, that will have future recurrences.¹ It is the most common neurological disorders worldwide affecting 3-6 per 1000 people. Incidence is highest in children less than 3 years of age, with a decreasing frequency in older children.² WHO estimates that, of the 50 million people with epilepsy in the world, 80% people live in developing countries.³ The incidence of epilepsy is higher during the first year than during any other subsequent period which is 146/100000.⁴

The etiology, clinical pattern, treatment of epilepsy varies with age dependent fashion and childhood epilepsy differs sharply from others.⁵ However there is little information available regarding early childhood

epilepsy. Diagnosis of epilepsy is largely based on clinical manifestation. Neurophysiological investigations support the diagnosis of the syndromes. Brain imaging is only able to identify the structural cause of the epilepsies. A precise therapy with appropriate antiepileptic drugs with optimal dose and duration can reduce the neurological morbidity to a great extent in children.⁶

The term "epilepsy" comes from the Greek "epilambanein" which means "to take hold of" or "to seize". Indeed written records of epilepsy date back to the second millennia before Christ. The idea that epilepsy was caused by humors, demons and toxic substances persisted through the middle ages. Slowly, the ideas of supernatural causation died out only to be replaced by another set of bizarre misnomers. After the start of bromide treatments in 1857, modern epilepsy

treatment proceeded at a quick pace. Phenobarbitone was introduced in 1912, and 24 years later, pioneer work on phenytoin was carried out. Carbamazepine, valproate and vigabatrin followed in 1954, 1973 and 1990 respectively.

Careful examination of the patient may reveal signs of neurocutaneous disorders, developmental abnormality, head trauma, alcohol or illicit drug abuse etc. Neurological examination regarding mental status, visual fields, motor system may suggest the location of lesion in the brain.^{7,8}

Therapy for a patient with a seizure disorder is almost always multimodal and includes treatment of underlying conditions, avoidance of precipitating factors, suppression of recurrent seizures by prophylactic therapy with anti seizure medications and/or surgery, and addressing a variety of psychological and social issues

Therefore, the present study was conducted to observe the type of epilepsy in young onset epilepsy patients admitted in or attending R. G. Kar Medical College and Hospital, Kolkata, West Bengal, India.

MATERIALS & METHODS

After approval of the ethics committee of R,G, Kar Medical College and Hospital and permission of West Bengal University of Health Sciences, Kolkata, West Bengal, India the present hospital based descriptive, observational study was carried out at the department of General Medicine, R,G, Kar Medical College and Hospital, Kolkata between January 2021 to June 2022.

Study Population

Patients admitted in and attending Out-patient Department of the General Medicine and Neuromedicine, manifesting with Sign and symptoms, clinical history of young onset (12 to 40 years) epilepsy were taken up for the study.

Sample Size

After applying Statistical formula: $n = (Z_{1-\alpha/2})^2 \times P \times Q / L^2$ and as per previous study by Jason S. Doescher *et al*, abnormal MRI of Brain findings were found in 32.6% of patients with epilepsy a sample size of 127 was considered for this study. During the study period, there were no dropouts from among those recruited

Inclusion Criteria

Patients with onset of epilepsy as per 'International league Against Epilepsy' definition between 12 years to 40 years was included in the study.

Exclusion Criteria

1. Patients with acute symptomatic seizure due to Metabolic etiology

2. Patients with seizures due to recurrent traumatic brain injury, post-operative seizures, seizures due to obstetric cause
3. Non epileptic syndromes that mimic seizures (Syncope, Psychological disorders, psychoactive drugs, Migraine, TIA, Sleep disorders, Movement disorders etc.)

Study Technique

Interview of patients and their near-relatives to elicit clinical history, clinical examination, investigation reports and statistical analysis

Procedure of Study

Patients with onset of epilepsy between 12 years to 40 years of age, admitted in and attending Out-patient Department of the General Medicine and Neuromedicine, manifesting with symptoms and signs of epilepsy accomplishing 'International League Against Epilepsy' Commission's definition of epilepsy were taken up for the study. A pre-designed and pretested clinical proforma was used for data collection. A detailed clinical history of patients regarding age of onset, prodromal symptoms, aura, ictal semiology, post ictal state, duration and frequency of seizure episodes and other salient neurological history were taken from witness and patient. All patients were carefully examined for Signs of infection or systemic illness, organomegaly, limb asymmetry, Trauma. Detailed neurological examination and careful assessment of mental status were done. Diagnosis was done on the basis of 'International League against Epilepsy' definition of Epilepsy. Seizure disorder not fulfilling the definition was excluded.

Statistical analysis

Compiled data were analysed using available appropriate statistical software. Different proportion and averages were calculated. Depending on the distribution pattern of observation, parametric or non-parametric statistical tests were used to find out relationship between different variables. The data was tabulated in Microsoft excel and analysed with SPSS V.24 software. The continuous variables are presented with mean and standard deviation. The categorical variables are presented with frequency and percentage. Chi square test was used for the comparisons. The p value ≤ 0.05 is considered as statistically significant.

Ethical considerations

Study was initiated after obtaining the informed consents from the participants and ethical clearance from the institutional ethical committee.

RESULTS

Table-1: Demographic Parameters of Epilepsy Patients. (n=127)

Age of onset	Male		Female	
	N	%	N	%
12-18years	2	2.90	7	12.07
18-30years	43	62.32	39	67.24
30-40years	24	34.78	12	20.69

Table 1 displays the demographic parameters of the sample population. 2.9% of the male and 12.07% of the female patients are between age 12 to 18 years, 62.32% of male and 67.24% of female patients are between 18 to 30 years and 34.78% of male and

20.69% of female patients are between 30 to 40 years. The mean age of the patients is found to be 34.3±10.4 years where as the age of onset of the disease is 26.1±6.5. 54.3% of the patients is male and 45.7% is female.

Table 2: Distribution of Epilepsy Patients According to type of seizures etc. (n=127)

Type of Epilepsy	Frequency	Percentage (%)
Generalized	75	59.06
Focal	52	40.94
Type of focal seizure		
Intact awareness	30	57.7
Impaired awareness	22	42.3
Focal seizure		
Evolution to Generalised seizure present	21	40.38
Evolution to Generalised seizure absent	31	59.62

In the present study 59.06% of the patients experienced generalized onset epilepsy while 40.94% of the patients experienced focal onset epilepsy. In the study 57.7% of the patients had intact awareness while 42.3% of the patients' awareness was found to

be impaired. Evolution into generalised seizure is reported in case of 40.38% of the patients while in case of 59.62% patients, evolution into generalised seizure was not found. (Table 2)

Table-3: Distribution of Aura of Epilepsy Patients with Focal Seizure according to the Awareness. (n=127)

Clinical presentations	Frequency	Percentage
Chest Pain	90	90.0
Profuse Sweating	65	65.0
Radiation to left shoulder/arm	45	45.0
Nausea/ vomiting	40	40.0
Anxiety	38	38.0
Breathlessness	35	35.0
Abdominal Discomfort	34	34.0
Palpitation	32	32.0

Table 3 presents the distribution of aura of epilepsy patients with focal seizure according to the awareness. Aura is auditory in nature for 20% patients with impaired awareness and 80% with intact awareness. Accordingly, the aura is visual for 50% patients with impaired awareness and 50% with intact awareness, olfactory for 100% patients with intact awareness, sensory for 55.6% patients with impaired awareness and 44.4% patients with intact awareness, motor for

50% patients with impaired awareness and 50% with intact awareness, cephalic for 12.5% patients with impaired awareness and 87.5% with intact awareness, and autonomic for 12.5% patients with impaired awareness and 87.5% with intact awareness. The difference in the distribution of focal seizure with impaired and intact awareness between various types of auras was statistically not significant (P= 0.202).

Table 4: Gender-distribution of epilepsy patients having different awareness

Different awareness	Male		Female		P value
	No.	%	No.	%	
Intact awareness	13	46.4	17	70.8	0.075
Impaired awareness	15	53.6	7	29.2	
Focal seizure with intact awareness	13	43.33	17	56.67	
Focal seizure with impaired awareness	15	68.18	7	31.82	

In male patients 46.4% have focal seizure with intact awareness and 53.6% patients have focal seizure with impaired awareness. Where as in female patients 70.8% have focal seizure with intact awareness and 29.2% patients have focal seizure with impaired awareness. The difference in distribution of type of focal seizure between male and female was not

statistically significant (P value = 0.075).

According to gender distribution of epilepsy patients having focal seizure with intact awareness 43.33% of the patients are male and 56.67% are female. In gender distribution of epilepsy patients having focal seizure with impaired awareness. 68.18% of the patients are male and 31.82% are female. (Table 4)

Table 5: Age-wise Distribution of Epilepsy Patients according to the type of Seizure

Type of seizure	12-18years	18-30years	30-40years	P value
Generalized	6 (66.66%)	48 (58.53%)	21 (58.33%)	0.890
Focal	3 (33.33%)	34 (41.46%)	15 (41.66%)	
Type of focal seizure				
Impaired awareness	2 (66.66%)	13 (41.93%)	7 (38.88%)	0.664
Intact awareness	1 (33.33%)	18 (58.06%)	11 (61.11%)	

Table 5 displays the age-wise distribution of epilepsy patients according to the type of seizure. 66.66% of the patients of age group 12 years to 18 years, 58.53% of the patients of age group 18 years to 30 years and 58.33 % of the patients of age group 30 years to 40 years show generalized onset epilepsy. Whereas, 33.33% of the patients of age group 12 years to 18 years, 41.46% of the patients of age group 18 years to 30 years and 41.66% of the patients of age group 30 years to 40 years show focal onset epilepsy. The difference in the distribution of age groups between generalised and focal seizure was statistically not significant (p= 0.890)

It is found that 66.66% of the patients of age group 12 years to 18 years, 41.93% of the patients of age group 18 years to 30 years and 38.88 % of the patients of age group 30 years to 40 years show focal epilepsy with impaired awareness. Whereas, 33.33% of the patients of age group 12 years to 18 years, 58.06% of the patients of age group 18 years to 30 years and 61.11% of the patients of age group 30 years to 40 years show focal epilepsy with intact awareness. The difference in the distribution of age groups between focal seizure with impaired awareness and focal seizure with intact awareness was statistically not significant (p= 0.664)

Figure 1: Etiology of Epilepsy Patients with Generalized Seizure.

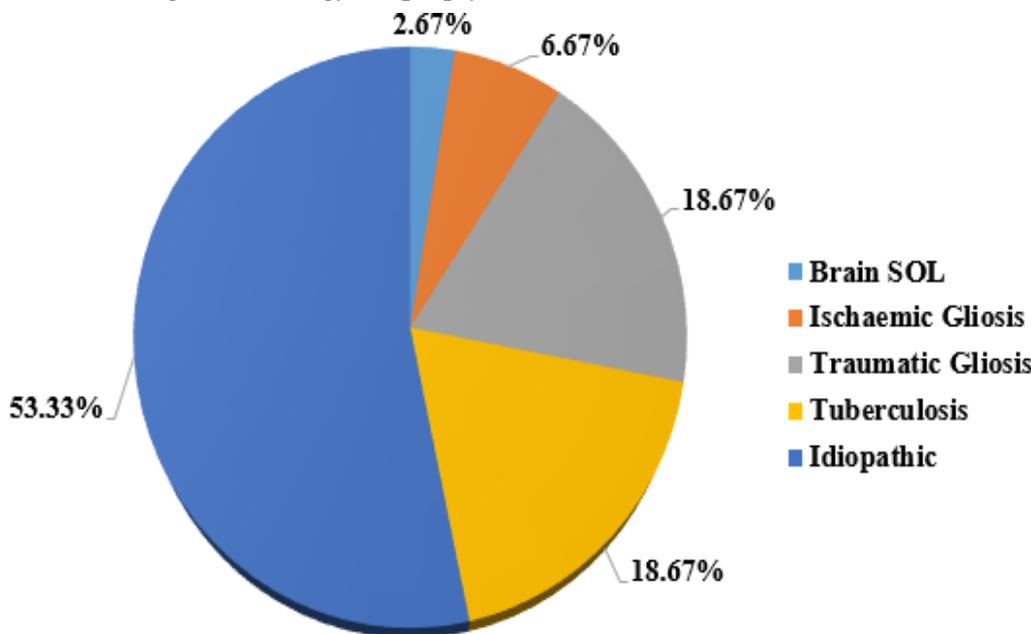


Figure 1 presents the etiology of generalised onset epilepsy. 2.67% of the patients are found to have brain SOL, 6.67% have ischaemic gliosis, 18.67% have traumatic gliosis, 18.67% have tuberculosis, and 53.33% are idiopathic.

Figure 2: Etiology of Epilepsy Patients with Focal Seizure.

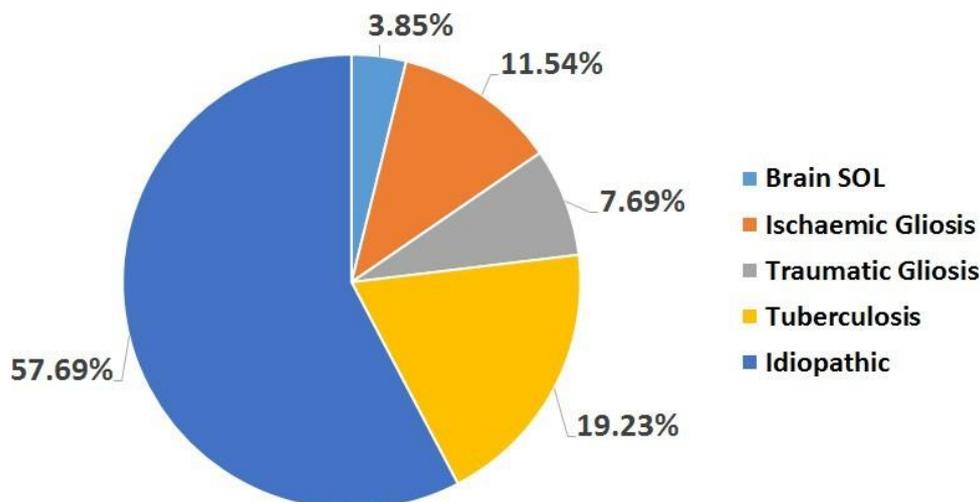


Figure 2 presents the etiology of focal onset epilepsy. 3.85% of the patients are found to have brain SOL, 11.54% have ischaemic gliosis, 7.69% have traumatic gliosis, 19.23% have tuberculosis, and 57.69% are idiopathic

Table 6: Finding of MRI and EEG in Epilepsy Patients

Method	Findings	No	%	P value
MRI	Abnormal	57	44.9	<0.001*
	Normal	70	55.1	
EEG	Abnormal	87	68.5	
	Normal	40	31.5	

*Statistically significant difference exists

Table 6 displays the Findings of MRI and EEG examination for the epilepsy patients. In MRI examination 44.9% of the cases were found to have abnormal and 55.1% cases were found to have normal findings. While EEG examination was abnormal in

68.15% of the cases and normal in 31.5% of the cases. The difference in the distribution of normal and abnormal findings between MRI and EEG was statistically significant (P < 0.001)

Table 7: Percentage of Patients according to the Site of abnormal discharge in EEG

Site of abnormal discharge in EEG	No	%
Generalized	61	71.8
Both frontal	12	14.1
Both occipital	5	5.9
Right frontal	4	4.7
Right occipital	1	1.2
Right parietal	2	2.3

Table 7 presents the percentage of patients according to the site of abnormal discharge in EEG. In 71.1% of the cases the abnormal discharge is generalized. The percentage of abnormal discharge found in both

frontal, both occipital, right frontal, right occipital, and right parietal region are 14.1%, 5.9%, 4.7%, 1.2% and 2.3% respectively.

Table 8: Percentage of Patients according to the Site of Lesions in MRI

Sites of lesion in MRI	No	%
Frontal	6	10.5
Parietal	13	22.8
Occipital	3	5.3
Temporal	1	1.8
Multilobar	34	59.6

Table 8 presents the percentage of patients according to the site of lesions in MRI. In 59.6% of the cases the lesion is multilobar. The percentage of lesions found in parietal, frontal, occipital and temporal region are 22.8%, 10.5%, 5.3%, and 1.8% respectively.

Table 9: Distribution of Number of Drug Prescribed to Epilepsy Patients according to Drug Compliance

Drug compliance	Numberof drug			P value
	One	Two	Three	
Good	21 (100%)	61 (83.56%)	18 (54.54%)	<0.001*
Poor	0 (0%)	12 (16.43%)	15 (45.45%)	

*Statistically significant difference exists

Table 9 presents the distribution of number of drug prescribed to epilepsy patients according to drug compliance. 100% of the epilepsy patients with one antiepileptic prescribed to them show good drug compliance followed by 83.56% and 54.54% patients who are prescribed two and three drugs respectively. 45.45% of the epilepsy patients with three

antiepileptics prescribed to them show poor drug compliance followed by 16.43% patients who are prescribed two drugs. The difference in the distribution of number of drugs prescribed between good and poor drug compliance is statistically significant ($P < 0.001$).

Table 10: Gender-wise Distribution of Epilepsy Patients according to Drug Compliance

Drug compliance	Male	Female	P value
Good	56 (81.15%)	44 (75.86%)	0.467
Poor	13 (18.84%)	14 (24.13%)	

Table 10 presents the gender-wise distribution of drug compliance among epilepsy patients. 81.15% of male and 75.86% of female patients are found to have good drug compliance. Whereas, 18.84 % of male and

24.13% of female patients are with poor drug compliance. The difference in the distribution of male and female between good and poor drug compliance was statistically not significant ($P = 0.467$)

Table 11: Age-wise Distribution of Epilepsy Patients according to Drug Compliance

Drug compliance	12-18years	18-30years	30-40years	P value
Good	1 (50%)	76 (85.39%)	23 (63.88%)	0.017*
Poor	1 (50%)	13 (14.6%)	13 (36.11%)	

*Statistically significant difference exists

Table 11 presents the age-wise distribution of drug compliance among epilepsy patients. 50% of the patients of age group 12 years to 18 years, 85.39% of the patients of age group 18 years to 30 years and 63.88% of the patients of age group 30 years to 40 years show good drug compliance. Whereas, 50% of the patients of age group 12 years to 18 years, 14.6%

of the patients of age group 18 years to 30 years and 36.11% of the patients of age group 30 years to 40 years show poor compliance to drugs. The difference in the distribution of age groups between good and poor drug compliance was statistically significant ($P = 0.017$)

Table 12: Distribution of Number of Drug Prescribed to Epilepsy Patients with Focal Seizure according to the Awareness

Type of focal seizure	Numberof drug			P value
	One	Two	Three	
Impaired awareness	3 (13.6%)	13 (59.1%)	6 (27.3%)	0.829
Intact awareness	6 (20%)	16 (53.3%)	8 (26.7%)	

Table 12 presents the distribution of number of drug prescribed to epilepsy patients with focal seizure according to the awareness. 59.1% of the epilepsy patients with focal seizure having impaired awareness are prescribed two drugs followed by 27.3% and 13.6% of the patients who are prescribed three and one drug respectively. 53.3% of the epilepsy patients with focal seizure having intact awareness are prescribed two drugs followed by 26.7% and 20% of the patients who are prescribed three and one drug respectively. The difference in the distribution of number of drugs prescribed for focal seizure with impaired and intact awareness was statistically not significant ($P = 0.829$)

DISCUSSION

The importance of adult onset seizures stems from its frequent association with secondary causes. With history, clinical examination, and appropriate investigations, including neuroimaging, if proper analysis of etiology is made, the presenting seizures can be treated accordingly, thus reducing associated morbidity and mortality.

Amongst the patients, the mean age of onset of epilepsy was found to be 26.1 ± 6.5 . Most of the patients belong to age group 18 years to 30 years. 62.32% of male patients and 67.24% of male patients are from this age group.

Majority of the patients were male (54.3%) in the study as seen in the study by [Kaur et al¹⁰](#) and [Garg et al¹¹](#) as well.

The most common type of epilepsy was found to be of Generalised onset (59.06%). Though focal onset

epilepsies are more common in this age group, generalized onset epilepsies are more common to bring the patient to medical attention.⁸ Focal onset seizure accounted for 40.94% of the study population. Focal seizure with intact awareness was found to be more common (57.7%) and only 40.38% of focal onset seizure had focal to bilateral spread.

59.4% male and 58.6% female patients found to have generalized onset seizure. Focal onset epilepsy is seen in 40.6% of males and most has impaired awareness (53.6%) and among patients with focal epilepsy with impaired awareness, majority is males (68.18%). Whereas, among females, 41.4% has focal onset epilepsy and most of them has intact awareness (70.8%) and among patients with focal onset epilepsy with intact awareness, most are females (56.67%).

With advancing age, prevalence of generalized seizures reduces while focal onset epilepsy become the predominant epilepsy type. In contrary, In this study, it has been found that in patients aged more than 30 years, 58.33% had generalised epilepsy and rest had focal onset epilepsy. Similar finding was reported by Kauret *al*¹⁰ and Garget *al*.¹¹ Generalised onset epilepsy was predominant type of epilepsy also in age groups 12 years to 18 years (66.66%) and 18 years to 30 years (58.53%).

Focal onset epilepsy with intact awareness was found to be predominant type of focal onset epilepsy in patients belonging to age group 18 years to 30 years (58.06%) and 30 years to 40 years (61.11%) but patients aged less than 18 years has focal onset epilepsy with impaired awareness predominantly (66.66%).

In this study, among generalized seizure cases, most common underlying etiology was idiopathic (53.33%) followed by tubercular infection of brain and traumatic gliosis both 18.66% and ischemic gliosis (6.66%). This findings were found to be consistent with previous studies and literature.

Among the patients with focal seizures, most common cause was idiopathic (57.69%) followed by tuberculosis (19.23%), ischemic gliosis (11.53%), Traumatic gliosis (7.69%) and brain SOL (3.84%). Similar result was described by Garget *al*.¹¹ In contrary, Kauret *al*.¹⁰ observed that most common cause of focal onset epilepsy was stroke (41.5%), followed by tuberculosis (26.8%), brain tumors (14.6%), gliosis (9.8%), idiopathic (4.9%).

In our study, different etiologies of adult onset seizures were noted according to different age. Ischaemic gliosis was most common cause (90.9%) of epilepsy in patients aged more than 30 years followed by traumatic gliosis (66.7%). Idiopathic (85.7%) was the most common cause of epilepsy in age group of 18 to 30 years followed by brain SOL (75%) and Tuberculosis (70.8%) which is consistent with the study of Kauret *al*.¹⁰ CVA, CNS infections, and idiopathic contributed to major fraction of adult onset seizures.

Age group wise, Idiopathic etiology was

predominantly seen in age group 18 to 30 years (85.7%). Most of the cases (70.8%) with tubercular etiology was also seen in age group 18 to 30 years. Ischemic gliosis was seen to be predominant cause of epilepsy in patients with age more than 30 years. This finding was also seen in the study conducted by Kauret *al*.¹⁰

EEG found to be abnormal in majority of the patients (68.5%) and were mostly generalised abnormal discharges (71.8%) followed by both frontal lobe discharges (14.1%) in our study. Similar finding was also described in the study by Tatamet *al*¹² and Kauret *al*.¹⁰ However, only in 35.4% of the cases, clinical localisation of seizure onset zone correlated with the site of abnormal discharge on EEG.

The present study shows, MRI of brain was found to be normal in majority of the patients (55.1%) and in most cases with abnormal MRI brain finding, there were multilobar lesions (59.6%) followed by parietal lobe lesion (22.8%), frontal lobe lesion (10.5%), occipital lobe lesion (5.3%) and temporal lobe lesion (1.8%). This finding was found consistent with the study by Garget *al*¹¹, Woermann and Vollmar¹³ and Kauret *al*.¹⁰ However, only in 14.9% of the cases, clinical localisation of seizure onset zone matched with the site of lesion on MRI brain.

Drug compliance is one of the important aspects of treatment of epilepsy and poor compliance to drug is one the major cause of recurrent uncontrolled seizures. In our study, good compliance to drugs was found in patients on one antiepileptic (100%) followed by two antiepileptics (83.56%), in males (81.15%) and in age group 18 to 30 years (85.39%)

CONCLUSION

The findings and interpretation of the current study as presented and discussed in the previous it can be concluded that the incidence of generalized onset epilepsy shows a falling trend and focal onset seizure shows the reverse trend as the age advances and males are more affected than female. Ischemic gliosis is found to be most common cause of epilepsy followed by traumatic gliosis in older age group. Where as in younger age group it is idiopathic, followed by brain SOL and tuberculosis. Most of the cases with generalized onset and focal onset epilepsy are of idiopathic etiology. Although EEG and MRI of brain are very useful study in diagnosing the type and location of a seizure onset zone and epileptic foci, they can be normal in a epilepsy patient. Hence, proper history and clinical examination of nervous system is very essential for every epilepsy patient.

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