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Prospective observational study of etio-pathogenesis, clinical profile and hospital outcome after antiepileptic treatment in patients with seizures

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Abstract

Background: In adults, seizure disorder is a one of major health concern in terms of burden of disease, nature of illness, and its impact on individual, family, and community. The present study was undertaken to assess clinical types, pathogenesis and clinical profile of seizures in adult and to study clinical correlation of seizures with EEG and Neuro imaging and hospital outcome after antiepileptic treatment.
Methods: Total 130 cases of age >12 years to till age presenting with new onset seizures were included in the study, during the period of one year from July 2014 -October 2016. A detailed history was taken, clinical examination, laboratory investigation and EEG, CT/ MRI were done.
Results: The mean age of cases was 27.8 ± 3.6 years with males' predominance (82; 63.1%). Convulsion was the most common presenting complaint (96 (73.8%) and GTCS was the most common type of seizure observed in 43 (33.1%) cases. The most common predisposing factor was stroke, found in 31 (23.8%) cases. On EEG report the most common pattern found was multifocal spike (42; 32.3%) while on MRI calcified neurocystecercosis was found in 4 cases (3.1%). Scar epilepsy was most common (42; 32.3%) followed by stroke infarct (21; 16.2%). The most common drug used for management of the cases was valproate (72; 55.4%) followed by phenytoin (58; 44.6%).
Conclusion: Identification and awareness about the etiological factors and seizure type help in better management of adult patients. Primary care physicians play a pivotal role in identifying patients with adult onset seizures and should encourage these patients to undergo neuroimaging so as to arrive at an appropriate etiological diagnosis.
Keywords: Seizure, Pathogenesis, Antiepileptic, Convulsion, Stroke, Neurocystecercosis, Epilepsy, Valproate, Phenytoin.

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1. Introduction

A seizure is a transient disturbance of cerebral function due to an abnormal paroxysmal neuronal discharge in the brain [1]. Depending on the distribution of electrical discharges, this abnormal brain activity can have various manifestations, ranging from dramatic convulsion activity to experiential phenomena not readily discernible by an observer [2]. Seizure disorder affects about 50 million people worldwide [3]. Although a variety of factors influence the incidence and prevalence of seizures, ∽ 5-10% of the population will have at least one seizure, with the highest incidence occurring in early childhood and late adulthood [4, 5].

Epilepsy is the syndrome of two or more unprovoked seizures that occur more than 24 hours apart[6] and it is common, affecting approximately 0.5% of the general population [7]. According to the International League against Epilepsy classification system, the many etiologies of seizures can be grouped into three categories such as genetic epilepsy, structural/metabolic epilepsy and unknown [8]. Determining the type of seizure that has occurred is essential for focusing the diagnostic approach on particular etiologies, selecting the appropriate therapy, and providing potentially vital information regarding prognosis.

Epilepsy of late onset may be simply defined as epilepsy beginning in adult life and which require special attention as regards to their etiology because these are likely to be due to an identifiable cause. Etiology and clinical profile of seizures in adults necessitate decisions about the initiation and discontinuation of pharmacotherapy that are different from those in younger patients [9].The Electroencephalogram (EEG) along with neuroimaging techniques (CT/MRI) is the most important investigation in the diagnosis and management of epilepsies [3] in adult patients. For evaluation of adults with new onset seizures, MRI has been shown to be superior to CT scan for the detection of cerebral lesions causing seizures; but, CT scan is an appropriate choice in emergency settings.

Considering above scenario, present study was carried out to assess various clinical types, pathogenesis and clinical profile of seizures in adult and to study clinical correlation of seizures with EEG and Neuro imaging and hospital outcome after antiepileptic treatment.

2. Materials and Methods

The present prospective observational study was conducted in the Department of Medicine at Mahatma Gandhi Institute of Medical Sciences (MGIMS), Sewagram, Wardha, Maharashtra, India. Total 130 adult patients of age >12 years to till age presented with new onset seizures were included in the study, during the period of one year from July 2014 -October 2016. This study was conducted on indoor patients after obtaining the permission of the Institutional Ethics Committee and written informed consent from all the patients. Patients with known seizure disorders on treatment, movement disorders, transient ischaemic attack and patient with psychogenic cause for abnormal movements or somatiform disorders were excluded from the study.

A pre-structural proforma was used to obtain detailed history, clinical examination, laboratory investigation, and EEG, CT/ MRI. The study require investigations or interventions to be conducted on patient as CT brain plain and contrast (if required), electroencephalogram, Hb%, total count, differential count, ESR, platelet, Random blood sugar, Renal function test, Liver function test, serum electrolytes, CSF studies (if needed) and MRI brain (if needed).The data was compiled in MS excel and it was analyzed using statistical software SPSS version 21.

3. Observations and Results

Total 130 cases with seizures were enrolled in the study, among them 82 (63.1%) were males and 48 (36.9%) were females. Majority of the cases were in the age group of 21-30 years (33; 25.4%) followed by 31-40 (29; 22.3%) and 41-50 years (19; 14.6%). Only 13 (10%) cases were below 20 years of age and 7 (5.4%) cases were above 70 years of age. The mean age of the cases was 27.8 ± 3.6 years, ranging from 16 to 80 years. Convulsion was the most common presenting complaint found in 96 (73.8%) of cases and other complaints and symptoms are shown in table 1.

Table 1: Chief presenting complaint and other symptoms of the cases

Complaint	N	Percent	Other symptoms	N	Percent
Convulsion	96	73.8	Altered Sensorium	8	6.2
Sweating/Giddiness	13	10.0	Decreased Response	3	2.3
Weakness	11	8.5	Fever	16	12.3
Involuntary Movement	10	7.7	Vomiting	30	23.1
Altered Sensorium	7	5.4	Generalized Weakness	9	6.9
Unresponsiveness	9	6.9	Giddiness	6	4.6
Continous Convulsion	5	3.8	Headache	14	10.8
Irrelevant Talk	5	3.8	Irrelevant Talk	3	2.3
Headache	5	3.8	Jaundice	6	4.6
Right and left weakness	4	3.1	Right and left sided weakness	4	3.1
Vomiting	4	3.1	Slurring of speech	5	3.8
Fever	7	5.4	No other symptoms	43	33.1
Focal Convulsion	3	2.3	-	-	-

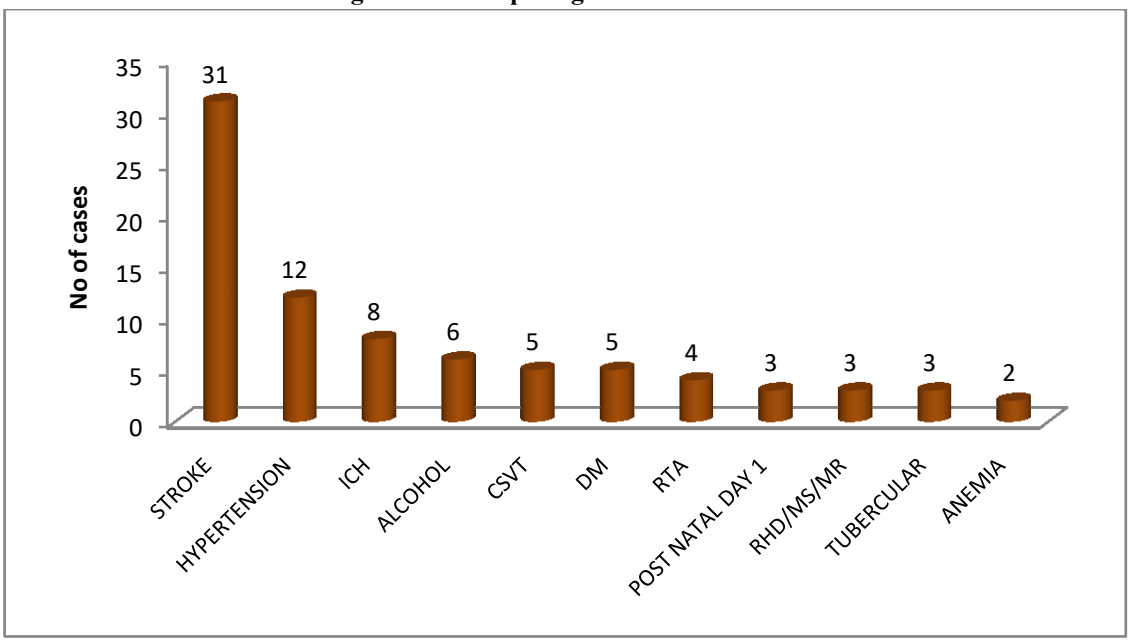
The most common type of seizure observed was GTCS, found in 43 (33.1%) cases. The next common type of seizure was focal seizure (with dyscognitive features) (22; 16.9%) and tonic clonic seizure (16; 12.3%), (Table 2). It was observed that most of the cases had 2-3episodes of seizures per week (62; 47.7%), 31 cases (23.8%) had 3-4 episodes per week, 24 (18.5%) had only 1 episode, 8 (6.2%) cases had persistent seizures and 5 (3.8%) had 6 episodes per week.

Table 2: Types of seizures

Types of Seizure	No of Cases	Percent
Absence	7	5.4
CPS	4	3.1
Epileptic Spasm	3	2.3
Focal Seizure (Without Dyscognitive)	10	7.7
Focal Seizure(With Dyscognitive Features)	22	16.9
GTCS	43	33.1
Idiopathic	3	2.3
Myoclonic	11	8.5
SPS	6	4.6
Status Epilepticus	5	3.8
Tonic Clonic	16	12.3
Total	130	100.0

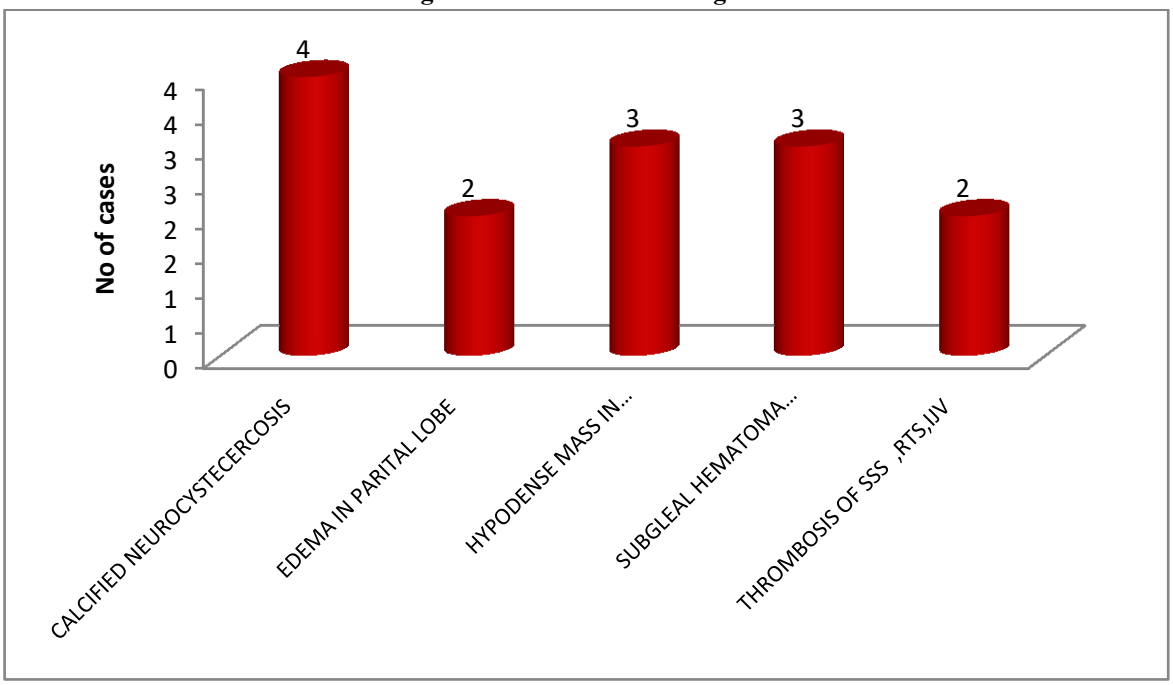
Various predisposing factors were identified among the cases as shown Figure 1. The most common factor was stroke, found in 31 (23.8%) cases, next common factor was hypertension found in 12 (9.2%) cases. Predisposing factors was not significant in 48 (36.92%) cases.

Figure 1: Predisposing factors for seizures



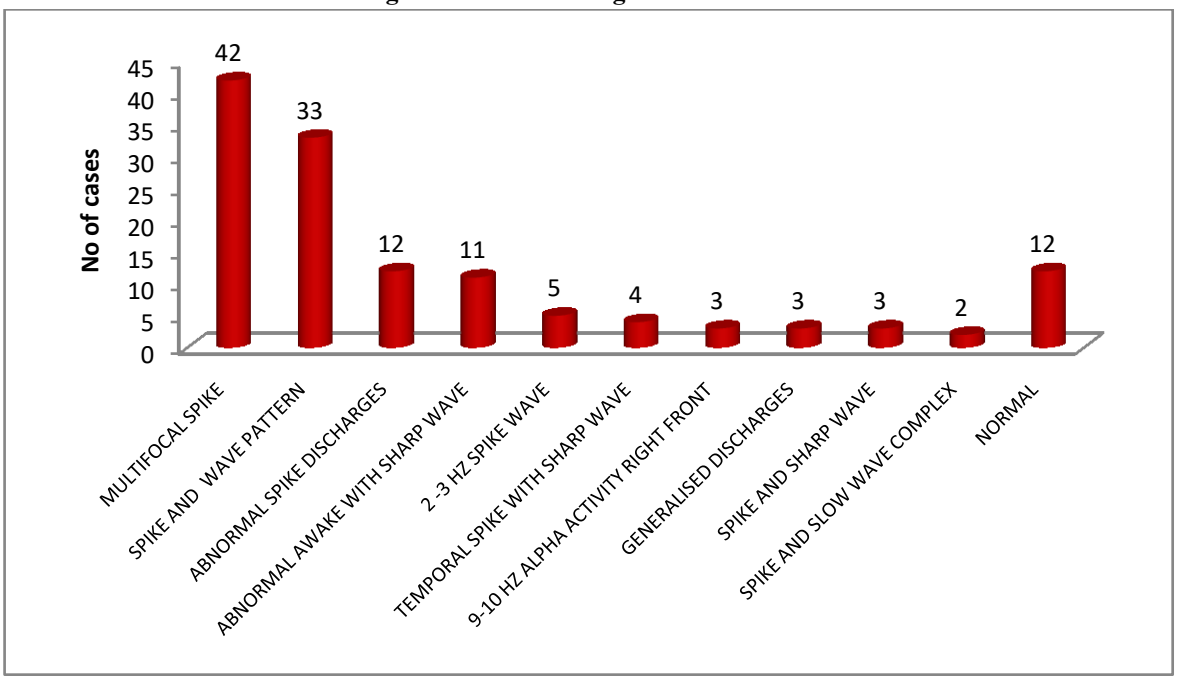
MRI was conducted for 39 cases, It was normal in majority of the cases 25 (19.2%). Calcified neurocystecercosis was found in 4 (3.1%) cases and other findings are shown in figure 2.

Figure 2: MRI brain findings



On EEG report the most common pattern found was multifocal spike in 42 (32.3%) followed by spike and wave pattern was seen in 33 (25.4%) cases. EEG was normal in 12 (9.2 %) cases, (Figure 3).

Figure 3: ECG Findings of the cases



Final diagnosis was made in almost all cases, Scar epilepsy was most common found in 42 (32.3%) cases, followed by stroke infarct in 21 (16.2%) and Epilepsy in 17 (13.1%) cases. Myoclonic epilepsy was seen in 11 (8.5%) cases and seizure disorder was found in 10 (7.7%) cases, (Table 3).

Table 3: Final Diagnosis of the cases

Final Diagnosis	No of Cases	Percent
Scar Epilepsy	42	32.3
Stroke Infarct	21	16.2
Epilepsy	17	13.1
Myoclonic Epilepsy	11	8.5
Seizure Disorder	10	7.7
Ich	8	6.2
Absence Seizure	7	5.4
Alcohol Intoxification With Se	6	4.6
Status Epilepticus	5	3.8
Acute Transverse Myelitis	4	3.1
Neurocystecercosis	4	3.1
Temporal Lobe Epilepsy	4	3.1
GlioblastomaMultiformi	3	2.3
Idiopathic Epilepsy	3	2.3
Localisation Related Epilepsy	3	2.3
Pnc Day1 /Seizure	3	2.3
Rhd/Ms/Mr/Seizure Disorder	3	2.3
Tubercular Meningitis	3	2.3
Csvt	2	1.5

Treatment profile of cases is shown in table 4. The most common drug used for management of the cases was valproate (72; 55.4%) followed by phenytoin (58; 44.6%).

Table 4: Management of cases

Treatment	No of cases	Percent
Valproate	72	55.4
Phenytoin	58	44.6
Oxcarbamezepine	10	7.7
Loraz	8	6.2
Carbamazepine	5	3.8
Levatrecetam	3	2.3

4. Discussion

Seizure disorder is a one of major health problem in adults mostly in late adulthood in which chances of seizures are increased especially due to comorbidities like cerebrovascular stroke, degenerative disease of brain, and brain tumour. In young adult patient main etiology of seizures were CNS Infection that includes brain Tuberculoma and Neurocysticercosis and other brain infection. With the help of newer neuro-imaging modalities and EEG it is possible to find out specific etiology of seizure, so EEG and imaging study should be integral part of investigation work of patient with seizure disorder.

In the present study, total 130 cases with new onset seizures were included. The mean age of cases was 27.8 ± 3.6 years with male predominance which is comparable with the other studies [10-12].The most common type of seizure observed was GTCS, and next common type of seizure was focal seizure with dyscognitive features, this is similar to the previous studies [13-15]. And all these studies found GTCS was the pre-dominant seizure type. Various predisposing factors were identified among the cases. The stroke was the most common cause (23.8%) of adult onset seizures, followed by hypertension (9.2%), ICH (6.2 %) and alcohol (4.6%) cases. CSVT and DM were each in 3.8% cases. Similar findings were reported by Ashwin *et al* [13], Kaur *et al* [16], Kanitkar *et al* [17] and Sendil *et al* [18] and all these studies found stroke was the most common cause of seizures.

In post ictal features, commonest was drowsiness found in 98 (75.4 %) of the cases while neuro-deficit was seen in 63 (48.5%) cases. The most common past history was stroke (17; 13.1%) followed by hypertension and ICH seen in 8 (6.1%) cases each. Alcoholism was detected in 6 (4.6%) cases. Cerebral palsy and RTA was noted in 4 (3.1 %) cases each. However 75 (57.7%) didn't give any significant past history. On fundus examination papiloedema was found in 31 (23.8%) cases and this was significantly higher in proportion. On examining the motor system, hypertonia was detected in 17 (13.1%) cases and 26 (20%) cases had hypotonia, while majority 82 (63.1%) had normal motor findings. 5 cases cannot tested. The planter reflex was bilateral flexor in 73 (56.2%) cases while it was bilateral extensor in 18 (13.8%) cases, In 11 (8.5 %) each it was either left or right extensor. However it was un-elicitable in 17 (13.1%) cases. Sensory involvement was revealed in 4 (3.1%) cases, hypotonia was noted in 2 (1.5%) cases, while remaining was normal. Hyponaremia was detected in 7 (5.4 %) of the cases. On CSF examination, INC PRT/Hypercel was observed in 7 (5.4 %) cases, it was normal in the remaining cases. GCS score was estimated for every case, majority of the cases had score of 6-10, in 86

(66.1%) cases, and it was above 10 in 35 (26.9%) cases while GCS was <5 in 9 (6.9%) cases.

MRI brain was done in 30% among total patients; in 19.2% patients, it was normal. The most common MRI abnormal findings were calcified neurocystecercosis (3.1%). Hypodense mass in paritooccipital region and subgleal hematoma /suependymal nodules were found in 2.3% cases each, edema in parital lobe and thrombosis of SSS, RTS, IJV was seen in 1.5% cases each. These findings are correlated well with the prior studies [16, 19].

All patients should undergo EEG and imaging study to find out specific etiology for best selective anti-epileptic treatment. On EEG report the most common pattern found was multifocal spike (32.3%) and spike wave pattern (25.4%) and abnormal spike discharges was in (9.2 %) cases, 8.5% had abnormal awake with sharp wave, and 2 -3 HZ spike wave was seen in (3.8%) cases, and 4 (3.1%) cases showed temporal spike with sharp wave on EEG. EEG was normal in 12 (9.2 %) cases and abnormal in 118 (90.76%). A study done in Jaipur [20] and Sudan [21] found that EEG was abnormal in 58.9% and 64.8% epilepsy patients respectively, which was less than our study.

Final diagnosis was made in almost all cases, Scar epilepsy was most common found in 42 (32.3%) cases, followed by stroke infarct in 21 (16.2%) cases and Epilepsy in 17 (13.1%) cases. Myoclonic epilepsy was seen in 11 (8.5%) of cases and seizure disorder was found in 10 (7.7%) cases. The most common drug used for management of the cases was Valproate in 55.4% cases followed by phenytoin in 44.6% cases. Oxcarbamezepine was used in 7.7% cases and 6.2% cases were prescribed Loraz. Similar to our findings Rezaeian Yazdi *et al* [22] found that the most widely used anticonvulsants were sodium valproate (53%), carbamazepine (37%), and phenobarbital. However Kariuki *et al* [23] in their study noticed that phenobarbital was the most common drug (95%).

4. Conclusion

The importance of adult onset seizures stems from its frequent association with secondary causes. Identification and awareness about the predisposing factors and seizure type help in better management of adult patients. With history, clinical examination, and appropriate investigations, including neuroimaging, if proper analysis of etiology is made, the presenting seizures can be treated accordingly. There was no mortality observed in the study. Primary care physicians play a pivotal role in identifying patients with adult onset seizures and should encourage these patients to undergo neuroimaging so as to arrive at an appropriate etiological diagnosis. In the face of recent advances in neuroimaging techniques, the future prospective management of adult onset seizures appears bright and convincing.

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