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Original Research Article

Clinical profile and short-term outcome in adult patients with new onset seizures

[1]Dr.Praveen Chowdary Meduri,[2]Annam Jayamadhavi,[3]Penchala Sudheer, [4]Susmitha Yella

[1,2]Assistant Professor of Neurology, NRI Medical College, Guntur, Mangalagiri Road, Chinakakani Guntur, Andhra Pradesh, India
[3]Consultant Neurologist, Vijayawada, Andhra Pradesh, India
[4]Professor and HOD Department of Neurology, NRI Medical College, Guntur, Mangalagiri Road, Chinakakani Guntur, Andhra Pradesh, India

Corresponding Author:
Dr. Praveen Chowdary Meduri

Abstract

Background: Since ancient times, seizures have affected individuals worldwide. Up to 10% of the population will have a seizure in their lifetime, most often in early childhood and late adulthood. Adult seizures have a distinct aetiology than childhood seizures and require special attention. Head trauma, CNS infections, space-occupying lesions, cerebrovascular accident, metabolic diseases, and medications are possible causes of adult-onset seizures.
Methods: This study was conducted at a tertiary hospital in South India. This is a single-center prospective study. 97 patients were included. Patients who met inclusion and exclusion criteria were reviewed using a case proforma, questionnaires, clinico-neurological examination findings, first diagnosis, clinical aspects including seizure type, antiepileptic drugs prescribed, and recurrent seizure data.
Results: The trial comprised 97 patients who had recently started having seizures. Clinical history was documented, including symptom onset and course. Neurological examination was performed. This material was classified using the ILAE seizure system. All the patients underwent 1.5T MRI or CT Brain scan and an EEG.
Conclusion: We explored generalized new-onset seizures. Elderly patients may be at a higher risk of recurrence following an initial stroke than younger people. Coronary artery disease, hypertension, diabetes, stroke are risk factors. People with abnormal imaging and/or an abnormal EEG should consider treatment after a first seizure.

Keywords: Term outcome, adult patient, seizures, hypertension, implications

Introduction

In 1870, hughlings Jackson, the eminent neurologist, postulated that seizures were due to “an excessive and disorderly discharge of cerebral nervous tissue on muscles”. The discharges may result in an almost instantaneous loss of consciousness, convulsive movements, disturbance of sensation or some combination thereof [1, 2]. Worldwide seizures are common disorders identified since antiquity and up to 10% population experience at least one seizure in life time with incidence being high in early childhood and late adulthood. Seizures

beginning in adult life when compared to childhood requires special attention because their etiology is different and are most likely due to trauma, central nervous system infections, space occupying lesions, cerebral vascular accidents, metabolic disorders and drugs. In adult's initiation and discontinuation of anti-epileptic drugs (AED)is also different from those in younger people [3-5].

Old age is a peak period for developing epilepsy and seizures. The Incidence of epilepsy and seizures is higher in the people more than 60 years of age than in other age groups. The incidence of epilepsy in India is estimated to be 3 per one lakh peopleand prevalence of it in India is 5.3%, slightly higher in the rural areas with a prevalence of 5.5% [6]. The literature indicates that epileptic seizures are often difficult to diagnose in the elderly for various reasons, such as difficulty in obtaining an accurate clinical history, a frequently atypical ictal presentation, and difficulty in diagnostically distinguishing between an epileptic and non-epileptic event. With the history, clinical examination and investigations, if proper analysis of etiology is made seizures can be treated accordingly thus reducing the morbidity and mortality associated with it [7, 8].

The causes and risk factors of seizures include head trauma, vascular malformations ofbrain most commonly arteriovenous malformations and cavernous malformations, brain tumors, parasitic infections,stroke,inflammatory and autoimmune disorders like systemic lupus erythematosus, multiple sclerosis, limbic encephalitis etc. [9-18]. Other risk factors include hypertension, chronic alcohol intake, alcohol withdrawal, heroin, cocaine abuse etc. [19-26].

In this study, we aimed to elucidate the etiology, clinical profile of seizures and describe co-morbidities in adults who presented with first seizure to our tertiary care hospital.

Aims and Objectives

- To know the various causes of new onset seizures in adult people.
- To know their clinical profile and radiological profile.

Materials and Methods

This is a single center, prospective study done in a tertiary care hospital in South India for a period of 18 months. A total of 97 patients were enrolled in the study.

Study selection criteria
Inclusion criteria

All patients aged above 18 years presenting to the Neurology department of our hospital with new onset seizures were recruited in the study.

Exclusion criteria

Seizure mimics like

1) Syncope.
2) Transient ischemic attack, hypoglycemia.
3) Movement disorders.

Study procedures

Patients fulfilling inclusion and exclusion criteria were subjected to detailed case proforma, questionnaires followed by ILAE seizure classification, demographic characteristics, the clinico-neurological examination findings, initial diagnosis, clinical features including seizure

type, antiepileptic drugs prescribed, recurrent seizure history. MRI brain/CT brain and EEG was done in all patients.

MRI

750 wide bore 1.5 Tesla GE made model was used. Laboratory and other investigations were done including electrolytes, serum calcium, magnesium, phosphorus, blood glucose, urea and creatinine levels, and electrocardiography (ECG).
Electroencephalogram (EEG) and brain imaging were obtained for all patients and response to the AED was observed during the hospital stay.

Statistical analysis

- Data was entered in excel-2007, analysis of data was done using SPSS-16 version.
- The correlates of recurrent variables were determined using logistic regression models.
- Each demographic and clinical variable was analyzed for marginal association with seizure recurrence using univariate logistic regression based on the P-value.
- Descriptive data was presented as frequencies and percentages.
- Unpaired t-test was applied to find the statistical difference between means.
- Data representation was done by appropriate pie charts, bar diagram and box plots for median.
- Data was tabulated as per the content appropriate.

Study end points: Study was done till the patient discharged, went against medical advice, or death of the patient.

Ethical considerations

Written informed consent was obtained from the patients. Confidentiality of the patients was maintained by blinding the case report forms and not mentioning their personal details.

Results

The study included 97 patients fulfilling the inclusion criteria with new onset seizures. Detailed clinical history was noted about the onset, progression of the symptoms, categorized under seizure groups according to ILAE classification after neurological examination. All patients were subjected to 1.5 T MRI Brain or CT brain andEEG.

Gender distribution: Of the 97 cases 60 (62%) were males and 37 (38%) were females.

Table 1: Gender distribution

Gender	Number (%)	Percentage
Male	60	62%
Female	37	38%

Table 2: Showing age distribution

Age	No of patients
18-30	36
31-40	16
41-50	05
51-60	17

61-70	13
71-80	10

Seizures are most common in the 2nd and 3rd decade of life after that most common in 6th decade and 7th decade.

Co-morbidities

Hypertension, diabetes, coronary artery disease (CAD), migraine and depression were the most common co morbidities documented.
Hypertension was documented in 21% (20) of the patients, followed by diabetes mellitus in14%(12), CAD in 6%(6), depression in 3%(3) and migraine in 4%(4).

Table 3: Co morbidities

Co morbidities	No of patients
Hypertension	20
Diabetes mellitus	12
Coronary artery disease	06
Migraine	04
Depression	03

Table 4: Showing Etiology

Etiology	No of patients
Post stroke seizure	19
Electrolyte abnormalities	15
Infectious cause	3
Alcohol	3
Trauma	1
Dementing illness	3
Auto immune encephalitis	3

Post stroke as the cause of seizures were identified in 19 patients (19.58%). Electrolyte abnormality was observed in 16 patients (16%)of which hyponatremia being the commonest cause. Other etiologies like alcohol induced seizures and Auto immune encephalitis were identified in 3 patients respectively. Dementing illness was observed in 3 patients and history of trauma is present in one patient.

Seizure type

Most common type of seizure in adult people in our study is generalized seizures –observed in 63 patients (64.94%), followed by focal onset type in 25 of patients (25.77%) and unclassified typein 9 of patients (9.27%).

Table 5: Seizure Type

Type of seizures	No of patients	% percentage
Generalised Tonic Clonic	63	64.94
Focal	25	25.77
Unclassified	9	9.27

Table 6: Electrolyte Abnormalities

Electrolyte abnormality	No of patients
Hyponatremia	5
Hypokalemia	4
Hyperkalemia	2
Hypomagnesemia	2
Hypocalcemia	2
Hypophosphatemia	1

MRI Brain abnormalities

Table 7: Representing MRI Abnormalities

Type of abnormality	No of patients
Chronic infarct and gliosis	13
Intracranial hemorrhage	2
Acute infarct	4
Mesial temporal sclerosis	1
Calcified granuloma	2
Meningitis	1
Encephalitis	4
Tuberculoma	1
Neurocysticercosis	1
Glioma	1
Subdural hemorrhage	1
Normal MRI	66

Table 8: Representing antiepileptic drugs prescribed

Drug	No of Patients
Levetiracetam	45
Phenytoin	32
Valproate	10
Clobazam	06
Oxcarbazepine	02
Lacosamide	02
Levetiracetam and clobazam	03

Table 9: Status epilepticus

Etiology	No of Patients
Auto immune encephalitis	3
Cerebral venous sinus thrombosis	1
Hyponatremia	1
Hyperglycemia	1

Discussion

The present prospective study was done in a tertiary health care setting, among 97 patients with objectives of understanding the clinical profile of patients presenting with new onset seizures and etiological profile of those patients. The results were compared with the available literature and presented in line with the objectives.

Among 97 patients, male were 60 and female were 37. In the ratio of 1.5:1 which is similar to study done by V. Muralidhar*et al*. [27]?In the present study incidence of first episode of

seizure is high in the 2nd and 3rd decade which is 37%, followed by 24% which is in the elderly people after 60 years of age. In the present study common type of seizure is generalised seizure in 63 patients (65%) followed by focal seizures in 25 patients (26%). In the generalised seizures most common age group involved is younger adults <30years- which is 40% followed by elderly adults >60years of age. (21.5%).

In the present study focal seizures are the common type of seizures in the elderly age group >60 years, which is 32%. The most common aetiology in this study is ischemic stroke (16%). Most of these patients presented with focal seizures. Co-morbidities in the present study are HTN andleft ventricular hypertrophy observed in 20 patients, diabetes in 12 patients, coronary artery disease is seen in 6 patients, migraine is observed in 4 patients. Common etiology of seizures in the present study is post stroke seizures (13), electrolyte abnormalities are seen in 16 patients. Auto immune encephalitisin 4 patients, dementia (3),alcohol (3),depression (3)and hyperglycemia is seen in one patient respectively.

Among metabolic abnormalities, hyponatremia is the common abnormality seen in 27% of patients. Hypocalcaemia and hypo magnesemia are the most common causes after hyponatremia. It is observed in 27% of patients, Hypocalcemia and hypomagnesemia are observed in 13% of people. A study done by Sarabjot Kaur *et al*., [28] found similar findings with hyponatremia (25%) and hypocalcemia (16.8%) in their study.

Table 10: Comparing our study with Sarabjot study

Electrolyte	Our study (%)	Sarabjot *et al.* (%)
Hyponatremia	27%	25%
Hypocalcemia	13%	16%

Autoimmune encephalitis is observed in 3 of our patients of which 2 patients were diagnosed with VGKC and one patient diagnosed with LGI1 antibody positive. Migraine related seizures are seen in 4 patients in our patients. In a study done by SK. Velioglu*et al*. found 7 patients had migraine in his study of 412 patients with migraine and seizure disorder [29].

Status epilepsy as De novo presentation of seizure was seen in 6 patients in the present study. Of which 3 patients were diagnosed with autoimmune encephalitis and 2 patients had metabolic abnormalities and one patient was diagnosed with cerebral venous thrombosis. Of which one patient died with sepsis and one patient went against medical advice.

In this study 3 patients presented with dementia and generalized seizures. Of these 3 patients two had Alzheimer's disease and one had frontotemporal dementia, all the patients were above 55years of age. In our study radiological abnormality was observed in 31 patients, of which chronic infarct and gliosis were observed in 13 patients, intracranial hemorrhage is seen in 2 patients, acute infarct is seen in 4 patients, encephalitis is observed in 4 patients, calcified granuloma in 2 patients, tuberculoma and neurocysticercosis each observed in one patient respectively. A study conducted by Ashwin *et al*. in 2017 over 100 patients had similar MRI Brainfindings with the present study mainly in number of stroke, tuberculoma and gliosis patients [30].

Table 11: MRI abnormalities in our study with Ashwin *et al*. study

MRI findings	Our study (%)	Ashwin *et al.* (%)
Infarct	17.52	18
Intracranial hemorrhage	2	4
Encephalitis	4	1
Calcified granuloma	4	8
Mesial temporal sclerosis	1	2
Tuberculoma	1	1
Subdural hemorrhage	1	-

Neurocysticercosis	1	-

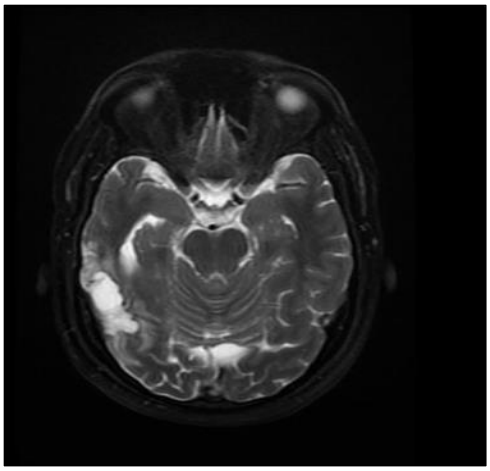
In our study most common AED prescribed was Levetiracetam in 45 patients followed by phenytoin in 33 patients. Seizures are well controlled with single AED in most of the patients, recurrence of seizures during the hospital stay occurred in 3 patients mainly observed in post stroke patients and metabolic abnormalities, in them second AED was prescribed according to the patient co morbidity.

Summary and Conclusion

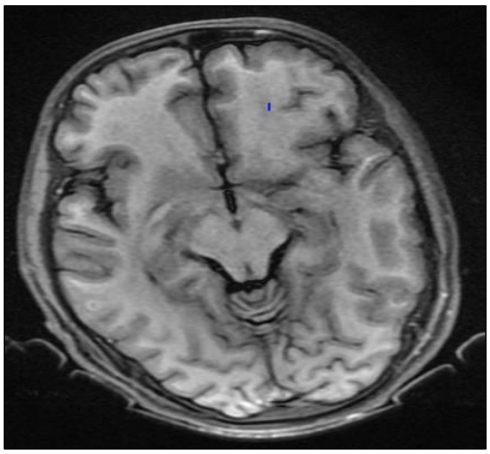
- In conclusion, most of the new onset seizures in our study are generalized seizures in nature.
- In post stroke seizures common presentation of seizures is focal onset.
- Stroke, hypertension, diabetes mellitus and CAD are the most common risk factors.

Based on our results, the implications are:firstly, elderly patients may be at a higher risk of recurrence following an initial stroke than younger people, and treatment following a first seizure should be considered, especially in patients who show a structural lesion on brain imaging and/or an abnormal EEG.

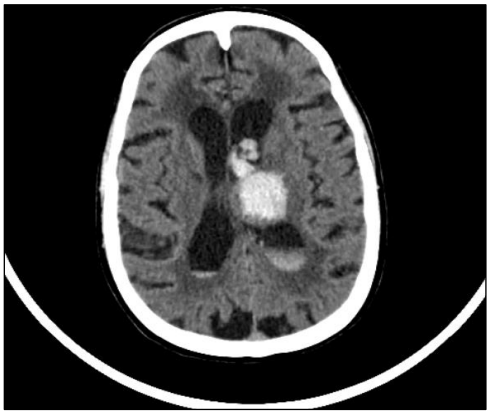
Gallery
Chronic infarct in right temporal lobe



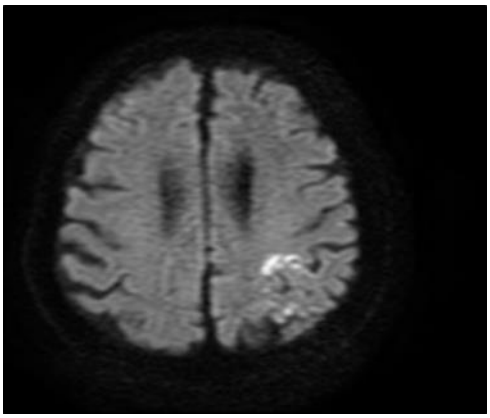
Ring enhancing lesion in right temporal lobe



Intracranial hemorrhage in left thalamic region with intraventricular extension



Acute infarct in left MCA territory



Limitations of the study

1) Study sample was small to make a conclusion to say the results are applicable to community-based studies and prevalence in the society and certain races.
2) Present study is a prospective study with data capturing single time, with short time follow up, so follow up may be need to done for longer periods of time to study co morbidities and seizure recurrence and AED's side effect profile.
3) Lack of comparison with age matched controls.

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