

Study of 50 cases of seizures in adults and its clinical profile.

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Abstract

A seizure (from the latin sacire’ “to take possession of”) is a paroxysmal event due to abnormal excessive or synchronous neuronal activity in the brain. Depending on the distribution of electrical discharges’ this abnormal brain activity to experiential phenomena not readily discernible by an observer. 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.^{1,2}

- ⊕ To study different type of seizures and its clinical profile.
- ⊕ To study etiology of seizures in various age group in adults.
- ⊕ To study neuroimaging and EEG in diagnosis of seizure disorders.
- ⊕ To study treatment outcome in different type of seizures.

The first steps in the management of a patients in GCSE are to attend to any acute cardiorespiratory problems or hyperthermia, perform a brief medial and neurologic examination, establish venous access, and send samples for laboratory studies to identify metabolic abnormalities. Anticonvulsant therapy should then begin without delay.

Keywords: CT Brain and MRI

Introduction

A seizure (from the latin sacire’ “to take possession of”) is a paroxysmal event due to abnormal excessive or synchronous neuronal activity in the brain. Depending on the distribution of electrical discharges’ this abnormal brain activity to experiential phenomena not readily discernible by an observer. 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.^{1,2} Seizures are known to occur in all geographical areas, all races, age and gender. For all these reason every physician should know something about seizure disorder and its treatment.¹

Now days there is an increasing incidence of adult onset seizures primarily be attributed to increased life expectancy and increase incidence of head injury. Improved health care, result in increased longevity, will unavoidably lead to an increased incidence of seizure disorder in the elderly.

Aims and Objective

- ⊕ To study different type of seizures and its clinical profile.

- ✦ To study etiology of seizures in various age group in adults.
- ✦ To study neuroimaging and EEG in diagnosis of seizure disorders.
- ✦ To study treatment outcome in different type of seizures.

Review of Literature

Historical background

Modern investigation of the etiology of seizures began with the work of Fritsch, Hitzig, Ferrier and caton in the 1870s. They recorded and evoked epileptic seizures in the cerebral cortex of animals. In 1929, Berger discovered that electrical brain signals could be recorded from the human head by using scalp electrodes and discovered electroencephalography (EEG) which was used to study and classify epileptic seizures.

Definition

Seizure is a paroxysmal event due to abnormal excessive or synchronous neuronal activity in the brain. 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.^{1,2,3}

Incidence

The annual incidence of seizures is found to be between 20-120 cases per 100000 of population.⁴ At least 2-5% of general population has atleast one episode of seizure in life time⁴. First in infants and early childhood when 2/3rd Cases of seizures occur and seizures in this period have widest array of presentation, second peak occur after 60 years of age.

Pathophysiologic mechanism of seizure

About one century ago, the father of modern concept of epilepsy, John Hughlings Jackson, proposed that seizures was caused by paroxysmal, excessive, rapid, focal

discharges. This insight provided valuable frame work for thinking about mechanism of focal seizure.

Mechanism of partial seizure.

Partial seizure begins in a very discrete area of cortex and then spreads to the neighboring area i.e., there is A phase of seizure initiation and A phase of seizure propagation. High frequency burst of action potential results from influx of calcium ion which leads to opening of voltage gated sodium channel leading to influx of Na⁺ which results in action potential. This is followed by hyper polarizing after potential mediated by GABA receptor of K⁺ channel. After action potential is over the inactivated Na⁺ channel are reactivated to take part in further action potential.

Mechanism of generalized seizure

Knowledge of the mechanisms responsible for initiation and propagation of most generalized seizures (including tonic-clonic, myoclonic, and atonic types) remains rudimentary and reflects the limited understanding of the connectivity of the brain at a systems level.

Brain imaging

Almost all patients with new-onset seizures should have a brain imaging study to determine whether there is an underlying structural abnormality that is responsible.

Imaging modality used in seizure disorder

CT Brain, MRI Brain, positron emission tomography (PET) scan and single Photon Emission computed Tomography (SPECT) scan.

The first steps in the management of a patients in GCSE are to attend to any acute cardiorespiratory problems or hyperthermia, perform a brief medical and neurologic examination, establish venous access, and send samples for laboratory studies to identify metabolic abnormalities. Anticonvulsant therapy should then begin without delay. The treatment of nonconvulsive status epilepticus is thought to be less urgent than GCSE, because the ongoing

seizures are not accompanied by the severe metabolic disturbances seen with CGSE. However, evidence suggests that nonconvulsive status epilepticus, especially that caused by ongoing, focal seizure activity, is associated with cellular injury in the region of the seizure focus; therefore this condition should be treated as promptly as possible.

Materials and Methods

The present study, “50 cases of seizures in adults and its clinical profile” was carried out in Department of Medicine and Department of Neuromedicine, SAMC & PGI, Hospital, Indore October 2015 to July 2016. In this present study, 50 patients with age > 18 years and of either sex were selected randomly from patients having seizures and admitted in Medicine Department and Neuromedicine.

Inclusion Criteria

All patients with seizure of any type and age > 18 years were included.

Seizures are diagnosed by proper history and examination and they were went through neuroimaging and EEG studies.

Exclusion Criteria

Patients < 18 years of age were excluded.

Methods

After taking detailed medical history, all patients underwent detailed general physical examination, systemic examination and routine laboratory investigation like CBC, renal function test, urine examination, liver function test and electrolytes. Afterwards patients went through special tests like CT brain, MRI brain and EEG.

Results

Table.1. Age Distribution

Age in years	Total No. of Patients	Percentage
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18-29	16	32%
30-39	10	20%
40-49	9	18%
50-59	6	12%
60-69	5	10%
>70 years	4	8%
Total	50	100%

The present study shows age wise distribution of seizures in total 50 cases. The highest number of patients, 16 (32%) fall in age group of 18-29. Followed by 10 (20%) patient fall in age group of 30-39. After that 9 (18%) patients in age group of 40-49. 6 (12%) patient in age group of 50-59. Lowest number of patient 5 (10%) fall in to age group of 60-69 and age > 70 years. In age group of 18-29 the incidence of idiopathic seizure is more common. The mean age of group was 40.66 ± 16.36 years.

Table.2. Sex distribution

Sex	Total no. of patients	Percentage
Male	30	60%
Female	20	40%
Total	50	100%

The present study out of total 50 patients, 30 (30%) are male and 20 (40%) are female. The present study shows male predominance.

Table.3. Type of seizure

Type of seizure	Number of patients	Percentage
Generalized	32	64%
Focal	18	36%
Total	50	100%

This study shows majority of patients, 32 (64%) experiencing GTCS type of seizures. Followed by focal, 18 (36%) having focal seizure.

Table. 4. Comparison of type of seizures

Study	Present study n=50		M Hirani et al ¹⁰ (2014) n=50		Sempere et al (1991)n= ⁹⁸	
	(n)	%	(n)	%	(n)	%
GTCS%	32	64%	30	60%	67	68.4%
Focal	18	36%	18	36%	32	31.6%
Mixed seizures	00	00%	2	4%	00	00%
Total	50	100%	50	100%	98	100%

The present study having 32 (64%) having GTCS which was comparable with M Hirani et al N=50,30 (60%), and Sempere et al n=98 (68.4%).

In present study the number of focal seizure having 18 (36%), which was comparable with M Hirani et al n=50, 18 (60%), and Sempere et al n=98 (31.6%).

The present study shows that 20 (40%) patient fall in to category of idiopathic seizure and in whom no definite etiology found. 9 (18%) patient were having post stroke epilepsy.

In present study 11 (22%) patient having infectious causes out of them neurocysticercosis 5 (10%), brain tuberculoma 5 (10%), brain abscess 1 (2%).

Rest of the patient having venous sinus thrombosis 3 (6%), followed by postpartum convulsion 2 (4%), mesial temporal lobe epilepsy 2 (4%), cerebral degenerative disease 1 (2%), metabolic 1 (2%),

Table.5. EEG study

EEG	No. of PATIENTS
Normal	32
Abnormal	18
Total	50

The study shows EEG findings in total 50 patients. Out of 50 patient only 18 (36%) having abnormal EEG findings that suggest that patient with seizure disorder having seizure focus in brain. But interictal EEG normal in most of the patients.

Table.6. Imaging studies.

Imaging Studies	CT brain N=50		MRI Brain N=38	
	(n)	(%)	(n)	(%)
Normal	38	76%	22	57.89%
Abnormal	12	24%	16	42.1%
Total	50	100%	38	100%

Out of 50 patients 12 (24%) having abnormal CT brain study and 38 (76%) having normal CT brain studies. Patient with normal CT brain study underwent MRI brain study. Out of 38 patients 16 (42.1%) having abnormal brain imaging and 22 (57.89%).

The total number of patient having imaging abnormality including CT and MRI brain was 38 (76%) and 12 (24%) patient having normal imaging studies.

Summary and Conclusion

- This was a study of 50 patients who were diagnosed as seizures disorder and were >18 years of age.
- The prevalence of seizures in male is slightly higher in compare to female. Male Female ratio is 3:2.
- The incidence of seizure disorder is higher in age group of 18-29 (32%), followed by in descending order 10 (20%) patient fall in age group of 30-39. After that 9 (18%) patient in age group of 40-49. 6(12%) patient in age group of 50-59. Lowest number of patient 5 (10%) fall in to age group of 60-69 and age >70 years.
- After 50 years of age chance of post stroke epilepsy increase.
- Generalized tonic-clonic seizure is main seizure type 32 (64%) followed by focal seizure 18 (36%)

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 (14%), degenerative disease of brain (2%), and brain tumour (2%). In young adult patient main etiology of seizures were CNS infection that includes brain tuberculoma (4%) and Neurocysticercosis (6%) and other brain infection⁵. 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. The present study was an effort to find out the various etiology and type of seizures in adult its types and clinical profile and response to drugs. Every patient should be investigated thoroughly and diagnosed and best suitable drug given depending upon type of seizures to this patient for proper control of seizures. The mortality was 3 (6%) in my study which was due to status epilepticus not controlled with routine treatment with gastric aspiration and respiratory depression.

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