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Seizure Semiology and Imaging Correlation

Authors
Dilip M Rampure[1], Rajhounsh[2], Rakesh Reddy R[3], Swetha D[4]
[1]Professor and Head, Dept of General Medicine, Mamata Medical College & General Hospital-Khammam, Telangana State
[2]Assistant Professor, Dept of General Medicine, Mamata Medical College & General Hospital-Khammam,Telangana State
[3]Post Graduate, Dept of General Medicine, Mamata Medical College & General Hospital-Khammam, Telangana State
[4]Post Graduate, Dept of General Medicine, Mamata Medical College & General Hospital-Khammam, Telangana State
Corresponding Author
Dr Swetha. Dandamudi
Dept of General Medicine, Mamata General Hospital, Khammam, Telangana-507002 India
Email: *dandamudiswetha@gmail.com Ph no - 9866151977*

ABSTRACT
Seizure is defined as paroxysmal event due to abnormal excessive hyper synchronus discharges from an aggregate of CNS neurons. Although variety of factors influence the incidence and prevalence of seizure, approximately 5-10% of population will have at least one seizure during their lifetime. This study is done to evaluate etiology of seizures, identification and localization of intracranial pathologies and correlation with CT scan. In our study58% had generalized seizures and 42% had partial seizures. Overall CT scan was abnormal in 48% of patients, 37.5% of generalized seizure group and 62.5% of partial seizure group patients. Majority of cases of generalized seizures were idiopathic.• Tuberculoma was the most common cause of partial seizure. With a reliable history and clinical examination, if proper analysis of etiology is made with available investigations, the epilepsy can be treated accordingly, thus reducing the morbidity and mortality associated with it.

INTRODUCTION

Seizure is defined as paroxysmal event due to abnormal excessive hyper synchronus discharges from an aggregate of CNS neurons. Although variety of factors influences the incidence and prevalence of seizure, approximately 5-10% of population will have at least one seizure during their lifetime. Although the cause of seizure varies of age, the onset of most of the seizures is in childhood or adulthood. Many causes are common result of endogenous factors, epileptogenic factors and precipitating factors. Precipitants include those due to intrinsic physiologic processes such as psychological or physical stress, sleep deprivation or hormonal changes associated with menstrual cycle on well on exogenous factors

such as exposure to toxic substance and certain medications. Clinical evaluation includes emphasis to (1) Establish whether the reported episode was a seizure rather than other paroxysmal event (2) Determine the cause of seizure by identifying risk factors and precipitating factors (3) Lab radiological and electrographical evaluation to determine whether there is an underlying structuralabnormality that is responsible. (4) Decide whether anticonvulsant therapy is required in addition to treatment for any underlying illness.When patient is presented with 1st episode of seizure, it is controversial to start antiepileptic drug therapy. Generally accepted risk factors associated with recurrent seizure include the following. (1) Abnormal neurologic examination (2) Seizure presenting as status epilepticus(3) Postictal todd's paralysis (4) Strong family history of seizure (5) CT and abnormal EEG.

MATERIALS AND METHODS

This is a cross sectional study conducted in 100 adult patients more than 12 years of age presenting with seizures to Mamata General Hospital and Mamata Super Speciality Hospital, Khammamfrom 1st Sep, 2014 to 31st Aug 2015 All patients who have seizures for the first time after 12 years of age.and epilepsy diagnosed according to ILAE were included. Seizures due to Metabolic causes, Cerebrovascular accident., Patients whose onset of seizures is before 12 years of age. And Pseudoseizures were excluded .

RESULTS

Maximum numbers of patients were in the age group of 18-39 years of age (39%). Male to female ratio is 1.38:1. Focal seizures were noted in 42 patients and Generalized seizures in 58 patients. Out of the 42 patients with focal seizures 11 had simple partial seizures 17 had complex partial seizures and 14 had partial seizures with secondary generalization. 52 patients were found to be idiopathic, 16 patients had neurocyst-icercosis, 28 had tuberculoma and 4 had brain tumour. Family history was noted in 6 patients. The CT scan brain,plain and contrast was done in every patient presenting with epilepsy.In idiopathic epilepsy group,the CT scan was normal. In patient with neurocysticercosis,the CT scan features were varying. It showed single small enhancing lesion in 8 (50%) patients,6(37.5%) patients,multiple small ring enhancing lesions in 2 (12.5%) patients. In patients with tuberculoma, the CT scan showed multiple large ring enhancing lesion,often with calcification, mid line shift due to cerebral edema in two cases.Many ring enhancing lesions in these patient were more than 20 mm in size

Age(years)	Number of patients	Percentage
12-19	21	21%
20-29	24	24%
30-39	17	17%
40-49	15	15%
50-59	10	10%
60-69	8	8%
70-79	5	5%

Etiology	Number of patients	Percentage
Idiopathic	52	52%
Neurocysticercosis	16	16%
Tuberculoma	28	28%
Brain tumour	4	4%

Type of seizure	Number of Patients	Percentage
SPS	25	25%
CPS	17	17%
GTCS	58	58%

DISCUSSION

There was a slight male preponderance (M:F-1.38:1) in our study as quoted by other studies on epilepsy in United States and Europe (Granieri et al,1983)[9].Maximum number of patients were in age group of 18-39 years,the youngest being 12

years. As epilepsy due to cerebral infections like neurocysticercosis and tuberculoma are common in middile age, more patients in our study belonged to age group of 18-39 years. In a similar study done by Pradeep et al mean age of patients was 41 years[10]. A family history of idiopathic epilepsy was noted in 6 of our patients with idiopathic epilepsy.This indicates the probable genetic determinant of the disease. Also one patientwith idiopathic epilepsy had febrile convulsions in childhood.This indicates his inherent lower seizure threshold.In our study, idiopathic epilepsy (52%) was the commonest cause, followed by tuberculoma (28%), Neurocysticercosis(16%) and Brain tumor (4%). In present study with clinical suspicion of epilepsy 48% had an abnormal CT scan . This is in contrast with 73% given by Vascon cellos and Lombardo, 25% given by Ahuja et al and Mohanta et al but correlates with that of 50.8% given by Lopez et al.The occurrence of partial seizures with or without secondary generalization was high in majority of studies and the quoted figures varied from 38% in Shorvan et al , 41.6% in J.L.Perez& Lopez et al but in current study it is found to be 42% corresponding to the data of J.L.Perez& Lopez et al .In the group of patients with partial seizures with elementary symptomatology 69% have abnormal CTscan in the present study , which compares favourably to 74% in Lopez et al and the data in other series.In the present study CT Scan was abnormal in 48% (48 out of 100) of patients with normal neurological examination and found to be abnormal in 69% of patients with simple/complex partial seizures with or without secondary generalisation .Therefore, CT scan is useful and essential in patients who present with simple /complex partial seizures with or without secondary generalization. In the study of Lopez et al 42.5% of patients with normal physical examination had an abnormal CT scan.It was very difficult to differentiate between tuberculoma and NCC based on CT findings .We did chest X ray PA view TB ELISA for patient suspected of tuberculoma. There was a history of chronic cough in one patient .Another patient who was diagnosed to have pulmonary tuberculosis one year back had taken anti tubercular drugs for about 3 months and now he presented with generalized tonic clonic convulsions. The CT scan showed 3 large ring enhancing lesions which were more than 20mm in size.In the present study a diagnosis of neurocysticercosis made on the basis of CT. morphology with multiple lesions all over the brain, particularly a ring enhancing lesion with small central hyperdensity suggestive of scolex in the cyst.This study of symptomatic epilepsy conducted in selected group of patients , the incidence is 16% In the present study of selected cases the brain tumour accounted for 4% (4 out of 100). It should be emphasized that despite careful investigations, a sizeable proportion of 52% were diagnosed as idiopathic epilepsy as compared to the other studies given below.Perez Lopex et al- 49%, White et al -22% , Present study - 52% . Patients less than 25 years constituted 40% cases (40%) as compared to 48% in a study by Mussico[1] (2002). Mean age at the time of seizure was 24.8 years in study of Mussico[1] (2002) and 32 years in study ofVon Donselaar[2] (2000). In study of patients 12 years or more, the most frequently affected age group is 20 to 30 years.. This is similar to result of Hopkins[3] (1998) in which most frequently affected age range was 16-29 years. Male to female ratio is 1.38:1 in present study. Most authors report a mild to moderate preponderance of males in their studies (Von Donselaar[2] 2000, Mussico[1] 2002, Hopkins[3]1998;). Annegers[4] (1996) and Bora[5] (1995) found a slight preponderance of female cases in their study. Family history was present in 6 cases (6%) in our study while Shinnar S and Berg AT [6](1998) found positive family history in 5% of caseswhich is almost similar to our study .CT scan head was done in all 100 cases. It was abnormal in 48 cases (48%) and normal in 52 cases of (52%). In a study by Wallace [7](1974) CT revealed lesion in 51 out

of 132 patients (38%) of single seizure. ScolloniLanzurri G [8](1977) showed that CT was diagnostic in 34% case of generalized seizure.

CONCLUSION

Seizures beginning in adult life are likely to be an identifiable causes compared to those beginning in childhood which are more likely to be idiopathic. Among the patients presenting with unprovoked seizures 58% had generalized seizures and 42% had partial seizures. Overall CT scan was abnormal in 48% of patients, 37.5% of generalized seizure group and 62.5% of partial seizure group patients. Various risk factors associated with risk of new onset seizures are tuberculosis, and positive family history. In cysticercosis the mode of infection is through contaminated vegetables. CT scan was reliable in revealing structural abnormalities and was helpful in establishing the diagnosis in majority of cases. Majority of cases of generalized seizures were idiopathic. • Tuberculomawas the most common cause of partial seizure.

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