

**CLINICAL AND ETIOLOGICAL PROFILE OF NEW ONSET FOCAL SEIZURES****Dr. N.N.ANAND¹, Dr. KRISHNA CHAITANYA ALAM*² AND Dr.V.PADMA¹**¹Professor, Department of general medicine, sree balaji medical college, Bharath university, chrompet, Chennai² Post graduate, Department of general medicine, sree balaji medical college, Bharath university, chrompet, Chennai.**ABSTRACT**

To evaluate the etiological profile of new onset focal seizures in adults with the help of neuroimaging studies, Immunological methods in a tertiary care hospital in Chennai. 50 Cases of new onset focal seizures were included in the study. The etiology was determined by neuroimaging and appropriate investigations were done. In the age group of 18-70 yrs maximum cases were seen between 18-30 yrs (48%). 18 (36.0%) were simple focal, 28 (56%) were complex focal, 4 (8%) were secondary generalized. CT scan showing localization to the parietal lobe in 36.1% cases. The associated symptom of headache is seen in 13.8% cases. Vomiting in 16.6% cases Fever in 25% of cases. Loss of consciousness in 8.3% of cases. Automatism seen in 4% of cases. In our study Complex focal Seizures are the most common focal Seizure Type. The age group, most commonly affected is 18 to 30 years. Granulomatous lesions & Cerebrovascular accidents are the most common cause of Focal Seizure in younger age groups. Among Central Nervous System infections/granulomatous lesions of brain, Neurocysticercosis & tuberculomas are most common. Incidence in male is more than in female.

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INTRODUCTION

Hippocrates recognized epilepsy as an organic process of the brain. However, many ancient writers considered seizures to be the work of supernatural forces. In fact, word epilepsy comes from a Greek word meaning “to be seized by forces from without.” J.H.Jackson gave direction to the understanding of epilepsy¹ in the late 19th century by fully analyzing individual cases. From his observations, Jackson formulated the modern definition of epilepsy; “an occasional, excessive and disorderly discharge of nervous tissue.” Jackson further concluded: this discharges occur in all degrees; it occurs with all sorts of conditions of ill health at the ages, and under innumerable circumstance. His emphasis on the clinical description of a seizure, beginning with the mode of onset, led to the concept of focal epilepsy with subsequent spread of discharging cells. The burden of epilepsy as estimated using the disability-adjusted life years (DALYs) accounts for 1% of the total burden of disease in the world. This study is done to evaluate the etiological profile of new onset focal seizures in adults in tertiary care hospital.

MATERIALS AND METHODS

- i. All out patient & in patients of Adults, in the age group of 18 – 70 with focal seizures who are admitted in the Departments of General medicine, Neurology & Neurosurgery in our Sree Balaji Medical college and Hospital, are evaluated during the period of Sept -2013 to Dec-2014.
- ii. Detailed history was taken and seizures categorized according to the classification proposed by International League against Epilepsy in 2005-09, thorough Clinical Examination performed to Detect any abnormality in the nervous system and also to screen the systemic disease with Special attention to Tuberculosis, CVA and Neurocysticercosis.
- iii. Diagnosis was verified by Neuroradiological and pathological test and Immunodiagnostic tests.
- iv. CT scan was done in all cases with a minimum of 4 weeks interval from symptoms onset.
- v. Contrast CT, MRI & EEG were done only when CT scan is inconclusive.
- vi. Repeat CT scan was done in 3 cases to further evaluate the fate of SSECTL.
- vii. CSF analysis done is patients who presented with fever and neck rigidity and raised, ICT signs

RESULTS

Total 50 patients of adult onset focal seizures were studied in age group of 18-70 years.

Table 1
Age and Sex Distribution

Age in yrs	No. of patients	Sex		Percentage
		Male	Female	
18-30	24	18	6	48.00%
31- 40	7	5	2	14.00%
41-50	9	6	3	18.00%
51-60	9	7	2	18.00%
61-70	1	1	0	2.00%

In the age group of 18-70 yrs maximum cases were seen between 18-30 yrs (48%), 51-60 yrs (18%), 41-50 – (18%), 31-40 yrs-(14%) , & 61-70 yrs -(2%).

Table 2
SEX INCIDENCE

No. of Patients	Male	Female
50	37 (74.0%)	13 (26.0%)

Table 3
CLINICAL FEATURES

Type of seizures	No. of patients	Sex		Percentage
		Male	Female	
Simple focal	18	11	7	36.00%
Complex focal	28	17	11	56%
Secondarily generalized	4	4	0	8%

90% patients presented within one week of throwing seizures. 18 (36.0%) were simple focal, 28 (56%) were complex focal, 4 (8%) were secondary generalized. Seizures were more on right side than left side. One case presented with visual symptoms only. Seizures started mainly from one side of body involving Upper Limb and Lower Limb in 94%

of cases. CT Scan showing localization to the parietal lobe in 36.1% cases. Status partialis continua was seen in 4 cases. The associated symptom of headache is seen in 13.8% cases. Vomiting in 16.6% cases. Fever in 25% of cases. Loss of consciousness in 8.3% of cases. Automatism seen in 4% of cases.

Table 4
The incidence of simple & complex focal seizures, in variable age groups, are shown here as follows

SEX	SEIZURE TYPE	18-30 YRS	31-40 YRS	41-50 YRS	51-60 YRS	61-70 YRS
FEMALE	SIMPLE FOCAL SEIZURE	2	1	2	2	0
	COMPLEX FOCAL SEIZURES	7	1	1	2	0
MALE	SIMPLE FOCAL SEIZURE	3	4	2	2	0
	COMPLEX FOCAL SEIZURES	7	3	6	1	0

Complex focal seizures are commonly seen in 18-30 yr age groups, with equal incidence in our study. Complex focal seizures are seen in 2nd large no. in males in between 41-50 yrs age group.

Table 5
Age & sex wide distribution of focal seizures in different etiologies as follows

S.No	DISEASE	SEX	18-30 YRS	31-40 YRS	41-50 YRS	51-60 YRS	61-70 YRS
1	CEREBRO VASCULAR ACCIDENT						
a)	INFARCT	Male	3	0	2	4	0
		Female	2	1	1	1	0
b)	HEMORRHAGE	Male	1	0	1	1	0
		Female	1	0	0	0	0
2	TUBERCULOMA	Male	3	1	1	0	0
		Female	4	0	0	1	0
3	NEUROCYSTICERCOSIS	Male	3	1	1	0	1
		Female	2	0	0	0	0

4	OLIGODENDROGLIOMA	Male	0	0	1	0	0
		Female	0	0	0	1	0
5	METS.IN BRAIN	Male	0	0	0	0	0
		Female	0	0	0	1	0
6	SUBARACHANOID HAEMORRHAGE	Male	0	0	0	0	0
		Female	0	0	1	0	0
7	DIABETIC KETOACIDOSDIS	Male	0	0	1	0	0
		Female	0	0	1	0	0
8	SUPERFICIAL GLOMA	Male	0	0	1	0	0
		Female	0	0	0	0	0
9	MENINGITS	Male	1	0	0	0	0
		Female	2	0	0	0	0
10	HIV	Male	0	0	0	0	0
		Female	1	0	0	0	0
11	CEREBRAL MALARIA	Male	0	0	0	0	0
		Female	1	0	0	0	0

CVA, ischemic infarcts have more incidences in males than females, in all age groups. Tuberculomas shows more female predilection, in 18-30yrs.Young females' show more incidences for NCC.

Table 6
Incidence of simple & complex focal seizures in male & females in various age groups

S.No	DISEASE	SEX	SEIZURE TYPE	18-30 YRS	31-40 YRS	41-50 YRS	51-60 YRS	61-70 YRS
1	CEREBRO VASCULAR ACCIDENT	Male	SIMPLE FOCAL SEIZURE	0	0	2	1	0
			COMPLEX FOCAL SEIZURES	2	0	0	2	0
a)	INFARCT	Female	SIMPLE FOCAL SEIZURE	2	0	0	1	0
			COMPLEX FOCAL SEIZURES	0	1	0	2	0
b)	HEMORRHAGE	Male	SIMPLE FOCAL SEIZURE	0	0	0	1	0
			COMPLEX FOCAL SEIZURES	0	0	2	0	0
		Female	SIMPLE FOCAL SEIZURE	0	0	0	0	0
			COMPLEX FOCAL SEIZURES	2	0	0	0	0

2	TUBERCULOMA	Male	SIMPLE FOCAL SEIZURE	2	2	0	0	0
			COMPLEX FOCAL SEIZURES	3	0	1	0	0
		Female	SIMPLE FOCAL SEIZURE	2	0	0	0	0
			COMPLEX FOCAL SEIZURES	0	0	0	0	0
3	NEUROCYSTICERCOSIS	Male	SIMPLE FOCAL SEIZURE	1	2	0	0	0
			COMPLEX FOCAL SEIZURES	2	1	0	0	1
		Female	SIMPLE FOCAL SEIZURE	1	0	0	0	0
			COMPLEX FOCAL SEIZURES	1	1	0	0	0
4	OLIGODENDROGLIOMA	Male	SIMPLE FOCAL SEIZURE	0	0	0	0	0
			COMPLEX FOCAL SEIZURES	1	0	0	0	0
		Female	SIMPLE FOCAL SEIZURE	0	0	0	0	0
			COMPLEX FOCAL SEIZURES	0	0	0	1	0
5	METS.IN BRAIN	Male	SIMPLE FOCAL SEIZURE	0	0	0	0	0
			COMPLEX FOCAL SEIZURES	0	0	0	0	0
		Female	SIMPLE FOCAL SEIZURE	0	0	0	0	0
			COMPLEX FOCAL SEIZURES	0	0	0	1	0
6	SUBARACHANOID HAEMORRHAGE	Male	SIMPLE FOCAL SEIZURE	0	0	0	0	0
			COMPLEX FOCAL SEIZURES	0	0	1	0	0
		Female	SIMPLE FOCAL SEIZURE	0	0	0	0	0
			COMPLEX FOCAL SEIZURES	0	0	0	0	0

7	DIABETIC KETOACIDOSDIS	Male	SIMPLE FOCAL SEIZURE	0	0	2	1	0
			COMPLEX FOCAL SEIZURES	2	0	0	2	0
		Female	SIMPLE FOCAL SEIZURE	2	0	0	1	0
			COMPLEX FOCAL SEIZURES	0	1	0	2	0
8	SUPERFICIAL GLOMA	Male	SIMPLE FOCAL SEIZURE	0	0	0	0	0
			COMPLEX FOCAL SEIZURES	1	0	1	0	0
		Female	SIMPLE FOCAL SEIZURE	0	0	0	0	0
			COMPLEX FOCAL SEIZURES	0	0	0	0	0
9	MENINGITS	Male	SIMPLE FOCAL SEIZURE	1	0	0	0	0
			COMPLEX FOCAL SEIZURES	0	0	0	0	0
		Female	SIMPLE FOCAL SEIZURE	0	0	0	0	0
			COMPLEX FOCAL SEIZURES	2	0	0	0	0
10	HIV	Male	SIMPLE FOCAL SEIZURE	0	0	0	0	0
			COMPLEX FOCAL SEIZURES	0	0	0	0	0
		Female	SIMPLE FOCAL SEIZURE	0	0	0	0	0
			COMPLEX FOCAL SEIZURES	1	0	0	0	0
11	CEREBRAL MALARIA	Male	SIMPLE FOCAL SEIZURE	0	0	0	0	0
			COMPLEX FOCAL SEIZURES	0	0	0	0	0
		Female	SIMPLE FOCAL SEIZURE	0	0	0	0	0
			COMPLEX FOCAL SEIZURES	1	0	0	0	0

Simple focal seizures are more common in females in ischemic infarcts, where as complex focal seizures are more in males. Tuberculomas have more male preponderance, regarding to simple & complex focal seizures.

CLINICAL SIGNS

Patients presenting with focal seizures showed very minimum clinical signs even after thorough clinical examinations. Speech abnormality seen in 12% cases. Cranial nerves involvement seen in 5% cases. Signs of raised ICT seen in 24% cases. Hemiplegia seen in 16.6% cases.

INVESTIGATIONS

- CBP: 6 cases had Eosinophilia, out of 10 cases which showing ring enhancing lesions.
- ESR raised in 13 cases
- X- ray chest showing infiltrates in 8.3% cases.
- X- ray of thigh normal in all ring enhancing lesions +ve patients
- CSF Analysis: TB meningitis in 2 cases, Bacterial meningitis in 1 case

- Anti Cysticercal anti bodies (ELISA) positive in 5 out of 10 ring enhancing lesions patients.

CT SCAN

- CT scan was taken in all cases. It was abnormal in 46(92.0%) cases and normal in 4 (8.0%) cases.
- The type of CT lesion suggestive of Ring enhancing in 20 (40.0%) cases out of which neurocysticercosis are 10 cases (confirmed by Anti Cysticercal anti bodies (ELISA). 10cases are Tuberculomas.
- Calcified lesions are seen in 8 (16.0%) cases.
- Infarcts (ischemic/hemorrhagic) are seen in 18(36.0%) cases.
- Tumors in 4 cases.
- Perilesional edema was mild in NCC, more in Tuberculoma and in Infarct.

Table 7
INCIDENCE OF AETIOLOGICAL PRESENTATION CORRELATING WITH CT

Cause	No. of Patients	Percentage
Cerebro Vascular Accidents	18	36
Neurocysticercosis	10	20
Tuberculoma with&with out calcification	10	20
Meningitis	3	6
Oligodendroglioma	2	4
Glioma(superficial)	1	2
Tumors	1	2
SAH	1	2
Normal CT	4	8

Table 8
CORRELATION OF TYPE OF SEIZURES WITH CT

Type of Seizure	No. Patients	C.T	
		Abnormal	Normal
Simple focal seizures	18	16	2
Complex focal seizures	28	26	1
Secondarily generalized	4	3	1

DISCUSSION

The present study was done to detect all possible lesions in focal epileptics to establish patterns of C.T/CECT, MRI Brain abnormalities, Immunodiagnostic tests in

epileptic patient and to monitor the response to treatment. In our study we found focal seizures to be primarily a disorder of the young. Most patients belongs to the age group

between 18 – 30 years (48.0%), this is similar to the study done S.Misra, R.Verma, O.P. Lekhra². They studied 1023 patients with focal seizures and correlated with C.T. scan. The seizure type in our study were mainly complex focal, this was seen in 56% of the cases studied. The incidence of simple focal seizures was 36.0%, is similar to the Rochester study done by Hauser and Kurland, which reported the incidence of complex focal seizures to be 42%, International League against epilepsy also quotes similar results. On symptom analysis we found that Ring enhancing lesion presented mainly with 3 – 4 episodes of focal seizures, 2 cases presented with epilepsia partialis continua. Headache and vomiting was seen in 16.0% of cases. In our study we found that residual neurological deficit to be uncommon in patients with focal seizures. Speech abnormality seen in 12% of cases. Hemiplegia was seen in 36.0% of cases, Cranial nerve involvement in 14% cases. On analyzing patient with ring enhancing lesions severe weakness with focal neurological deficit was seen only in 2 cases. Bhatia also reported similar findings with respect to ring enhancing lesion. The overall C.T. abnormality is detected in 92.0% of cases, this is in correlation with study done by S. Misra and R.Verma and O.P. Lekhra² showing 79.3%, various studies in the past reported C.T. abnormalities in 25 – 70% of focal seizures. Normal C.T. scan is found in 4.0% of cases. The C.T. abnormality of ring enhancing lesion was seen in 20 cases (40.0%) in our studies, but it is not correlating with the studies done by S. Misra¹ in which they found 63.3% incidence. In a study from West India, Wadia³ found single small enhancing lesion in 26% of patients with focal seizures. In a study from north India, Bansal⁴ found this lesion in 39.5% patients with focal or generalized seizures. In the present study neurocysticercosis & tuberculomas are the causes of ring enhancing lesion in 20.0% & 20.0% of cases respectively. This is not fully correlating with the study done by Dr. Rajashekar⁵ where the incidence of neurocysticercosis in ring enhancing lesion is 60%. In 50% of cases (5 out of 10 cases) location of ring enhancing lesion is in parietal lobe; Rajashekar⁵ found 82.5% of neurocysticercosis occurs in parietal lobe. In 1980 Bhargava and Tandon⁶ reported

tuberculoma was the most common cause of ring enhancing lesions. In a C.T. guided biopsy Chandy showed 7 out of 15 cases were neurocysticercosis. Rajashekar⁷ performed excision biopsy in 15 patients with solitary ring enhancing lesion – Cysticercus granuloma was diagnosed in 7, a parasitic granuloma without parasite evidence in 5, chronic inflammation in 2 cases and fibrous cicatrix in 1. There were no tuberculomas, they concluded that neurocysticercosis tops the line. Wadia⁸ et al suggested at least a third or more lesions are tuberculomas, of their 30 cases 10 had active pulmonary tuberculosis. 1 had histological evidence of tuberculoma and 1 developed T.B. meningitis. On Dyek & Kumar⁹ also proposed tubercular origin of these lesions. This was based on resolution of these lesions with Anti Tuberculosis Treatment. Immunodiagnostic Tests: In our study out of 20 cases of ring enhancing lesions 10 cases were positive for Anti cysticercal antibodies by ELISA method in 50.0%. Rajashekar⁷ found ELISA was sensitive in 48%, specific in 58% of cases, Singh et al found ELISA positive in 56.8% of cases with a ring enhancing lesion. All patients with ring enhancing lesion responded well to treatment with anti epileptic drugs with mono therapy. There was no recurrence of seizures in all patients in our study. In a study done by Rajashekar⁷ 14.5% of patients had recurrence of seizures, in most of the patients seizure control was achieved with mono therapy, 12% of patients required second anti epileptic drug. Murthy and Reddy¹⁰ achieved good seizure control in all of their 102 patients with mono therapy. In our present study we treated all 5 patients of neurocysticercosis with Albendazole and Steroid for 4 – 6 weeks, repeat CT scan was done in 3 cases, 2 cases showed disappearance of lesion. In 1 case, lesion calcified. Rajashekar⁷ studied 11 patients, they found resolution of lesion in 2 patients in repeat C.T. scan and more the 50% reduction in size in 2 patients, in their second study on 43 patients 20 patients (46.5%) responded positively. Murthy and Reddy¹⁰ suggested Albendazole therapy in patients with C.T. scan showing Scolex. Padma¹¹ performed a double blind randomized placebo controlled trial with Albendazole in 75 patients and concluded that Albendazole had no beneficial effects.

Rajashekar⁷ noticed adverse effects of Albendazole therapy in 15 out of (35%) 43 patients. In our present study no patient had side effects. Calcified lesions were found in 11% of cases. This is in correlation with the study done by R. Mishra and Verma² Vascular lesions were found in 16.6% cases. A study done by Murthy¹⁰ they found 25% of incidence. Tumors were found in 2.5% of cases, whereas in a study done by Murthy¹⁰

they found 3% of incidence and in Misra² study they found 4.6% incidence. 1 case of Tuberculoma had evidence of T.B. meningitis and pulmonary kochs, Wadia⁸ found 30 out of 100 cases they studied had active pulmonary T.B. and in 1 case had T.B. meningitis. Among patients with evidence of neurocysticercosis there was no significant difference in vegetarians and non vegetarians.

CONCLUSIONS

- In our study Complex focal Seizures are the most common focal Seizure Type.
- The age group, most commonly affected is 18 to 30 years.
- Granulomatous lesions & Cerebro vascular accidents are the most common cause of Focal Seizure in younger age group
- Among Central Nervous System infections/granulomatous lesions of brain, Neurocysticercosis & tuberculomas are most common.
- Incidence in male is more than in female.
- In patients of 41- 60 yrs of age, vascular Pathology is the most common cause of Focal Seizures.
- C.T. Scan is conclusive in 92.0% of Adult Onset Focal Seizures.
- Ring enhancing lesion was found in 40.0% cases.
- In 8.0% of cases. CT scan was inconclusive.
- Both CT and EEG were inconclusive in 8.0% of cases.
- CECT & MRI Brain is helpful, when the CT was inconclusive.
- Immunodiagnostic tests are helpful in differentiating between Neurocysticercosis and Tuberculoma
- There is no significant difference in incidence of Neurocysticercosis between Vegetarians and Non – Vegetarians.
- All patients with cerebrovascular accidents, with focal seizures responded well with AEDs, anti cerebral edema measures, & anti platelet drugs in ischemic strokes
- All patients of Ring enhancing lesions responded well to treatment with Anti Epileptic Drugs.
- 25% of Neurocysticercosis resolved after treatment with Tab. Albendazole + Steroids + Anti Epileptic Drugs.
- Rarely T.B. Meningitis and Cerebral Malaria can also present as focal Seizures.

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