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ETIOLOGICAL STUDY OF NEW ONSET SEIZURES

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Abstract

Background and objective - Seizures are common disorders found all over the world and are encountered frequently during medical practice in variety of settings. Etiological spectrum of acute symptomatic seizures in developing countries is different from developed countries. So this study was done to know the various etiologies of new onset seizures in adults in this region.

Methods - Consecutive 100 Cases of new onset seizures from the hospital attached to Vinayaka Mission's Medical College, Karaikal, were included in the study. The etiology was determined by neuro imaging and appropriate investigations including cerebrospinal fluid examination.

Results - Of 100 patients 89% were acute symptomatic seizures 40% of SE were caused by neuro infections. Neuroinfection was the leading cause of seizure, which accounted for 34%, followed by Cerebrovascular accidents (29%) and metabolic (9%). Neuro cysticercosis is most common cause in neuroinfection (35%), followed by meningitis (29%) and cerebral malaria (17%). 8% of seizures were because of CNS Tuberculosis. 55% of the CVA were due stroke and 34% due to CVT. 14% of seizures were pregnancy related. In patients with cerebrovascular diseases, aged under 40 years, cerebral venous thrombosis accounted for79%.

Key words - acute symptomatic seizures; infections of central nervous system; neurocysticercosis; cerebral venous thrombosis.

1.0 INTRODUCTION

Seizure has been recognized since antiquity and probably as old as man himself. Seizures are common disorders found all over the world and are encountered frequently during medical practice in variety of settings [1].In Indian subcontinent cerebral venous thrombosis is common in post- puerperal women presents with severe headache, low-grade fever and seizures. Seizures occur in about 40 percent of patients, which is higher when compared to arterial stroke. Focal seizures are more common but they can generalize to a life- threatening status epilepticus [2].

Etiology of seizures can be easily made out in most of the older patients. The causes include subdural haematoma, stroke, CNS infections, degenerative disorders like

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Alzheimer's disease and malignancy which includes malignant gliomas, and brain metastases. In stroke seizures occur more commonly with hemorrhagic stroke than with ischemic stroke. They also can occur with systemic metabolic conditions like uremia, hyperglycemia, hypoglycemia, hyponatremia and alcohol withdrawal [3, 4].

Seizures can be presenting feature in tubercular meningitis, which is most common type of chronic meningitis in India. More than 60% of patients with intracranial tuberculoma may have seizures. So this study is done to know the various etiologies of new onset seizures in adults in this region. With the advent of modern technologies like CT scan, MRI and CSF serology for infection like viral, tubercular, neurocysticercosis, the diagnosis of seizure has become more accurate and has completely changed the course of management [5,6].Hence the present study was designed to study the etiology of new onset seizures.

2.0 MATERIALS AND METHODS

2.1. Source of data

100 patients admitted with new onset seizures from the hospital attached to Vinayaka Mission's Medical College, Karaikal, who fulfilled the inclusion and exclusion criteria as mentioned below.

2.2. Methods of collection of data

Patients presenting with history of seizures were included in the study. Patient and eyewitness were interviewed regarding history, and clinical examination was done as mentioned inproforma.

2.3. Investigations Done

The investigationsincluded haemoglobin level, total count, differential count, ESR, urine routine, blood urea, serum creatinine, blood glucose levels, liver function test and estimation of serum electrolytes like sodium, potassium, and calcium.Special investigations like lumbar puncture, serological tests, CT scan brain, EEG were done in selected cases [7, 8].

2.4. Statistical method and software

The collected data was analyzed using the computer programme Statistical Package for Social Sciences (SPSS 11.0) and Systat 8.0. Microsoft word and Excel have been used to generate graphs tables etc. Descriptive analysis was used to compute percentage, to calculate Mean and Standard deviation [9,10].

3.0. RESULTS

In the present study patient's age ranged from 17 years to 80 years, with Mean of40.51 years.Majority of patients were in the age group of 21-30 years (n = 28, 28%) followed by 41-50 years (n = 19, 19%).78% 0f the patients were in the 2nd-5th decade.12% 0f the patients were in the age group of >60 years.Out 100 patients 55 were males and 45 were females, with male to female ratio of1.22: 1.0. Majority of males were in 5th decade and females were in 3rd decade.

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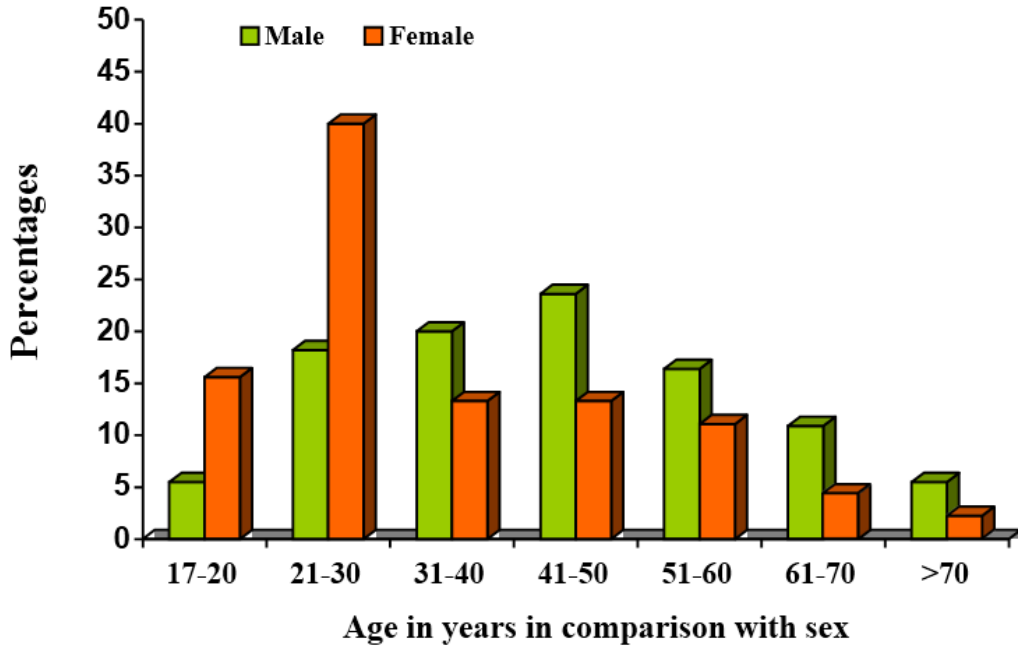

Figure 1: Age in years in comparison with sex

3.1. Distribution of etiologies in patients with seizures

Neuroinfection is leading cause of seizure, which accounted for 34%, followed by Cerebrovascular accidents (29%) and metabolic (9%). In 9% of patients cause is idiopathic (cryptogenic). Among Neuroinfection (n=34). Majority of seizures were because of Neurocysticercosis accounted for 35% followed by meningitis 29% and cerebral malaria 17%. Among Cerebrovascular accidents (n=29). Stroke accounted for 55% (Infarct-10, Haemorrhage-6), followed by cerebral venous thrombosis 34%. 14% of seizures were pregnancy related. (CVT-11 + Elcampsia-3). In metabolic seizures (n=9) 55% were because of hypoglycaemia.

Table 1 - Distribution of etiologies in patients with seizures

Etiologies	**Number (n=100)**	**%**
1.Neuroinfection	***34***	***34.0***
Meningitis	10	10.0
Meningoencephalitis	3	3.0
Neurocysticercosis (NCC)	12	12.0
Cerebral malaria	6	6.0
Tuberculoma	3	3.0
2.Cerebrovascular accidents	***29***	***29.0***
Infarct	10	10.0
Haemorrhage	6	6.0
Cerebral venous thrombosis	11	11.0
SAH	1	1.0
Subdural haemorrhage	1	1.0
3.Idiopathic	***9***	***9.0***

4.Metabolic	***9***	***9.0***
Hypoglycaemia	5	5.0
Hyperglycaemia	1	1.0
Hypocalcaemia	1	1.0
Hyponatraemia	2	2.0
5.Tumor	***6***	**6.0**
Meningioma	1	1.0
Glioma	2	2.0
Secondaries	1	1.0
Glioblastoma	2	2.0
6.Miscellaneous	***6***	***6.0***
A-V malformations	2	2.0
Post dialysis	1	1.0
Alcohol withdrawal	3	3.0
7.Poisoning	***4***	***4.0***
OP compound	2	2.0
Strychnine	1	1.0
Yellow oleander Poisoning	1	1.0
8.Elcampsia	***3***	***3.0***

3.2. Distribution of various etiologies

Majority of seizures were because of neuroinfection 38.2%, followed by CVA 20%, Idiopathic 12.7%, and metabolic 10.9%. 62 % of Neuroinfection seizures accounted for 38% of seizures in males. 38% of CVA seizures accounted for 20% of seizures in males. 77% of Idiopathic seizures accounted for 12.7% of seizures in males. 66% of metabolic abnormality accounted for 10.9% of seizures in males. 100% of the seizures due to Alcohol withdrawal occurred in males (all occurred in males). Among CVA (n=11). Majority of seizures were because of infarct 63.3%, followed by haemorrhage 27.2. In females (n=45), Majority of seizures were because of CVA 40% (18), followed by neuroinfection 28.9% (13), poisoning 8.9% (4), metabolic 6.7% (3), and eclampsia 6.7% (3). 62% of the seizures due to CVA occurred in females. 38% of the seizures due to Neuroinfection occurred in females. 100% of the seizures due to Poisoning occurred in females (all occurred in females). Among CVA (n=18), Majority of seizures were because of CVT 61% (11), followed by infarct 16% (3) and haemorrhage 16% (3). All the seizures due to CVT occurred in females, and all were postpartum. 31% of seizures were pregnancy related.

3.4. Etiologies according to sex distribution

In males (n=55), majority of seizures were because of neuroinfection 38.2% (21), followed by CVA 20% (11), Idiopathic 12.7% (7), and metabolic 10.9% (6).62 % of Neuroinfection seizures accounted for 38% of seizures in males. 38% of CVA seizures accounted for 20% of seizures in males.77% of Idiopathic seizures accounted for 12.7% of seizures in males. 66% of metabolic abnormality accounted for 10.9% of seizures in males.100% of the seizures due to Alcohol withdrawal occurred in males (all occurred in males). Among CVA (n=11), Majority of seizures were because of infarct 63.3% (7),

followed by hemorrhage 27.2% (3). In females (n=45), Majority of seizures were because of CVA 40% (18), followed by neuroinfection 28.9% (13), poisoning 8.9% (4), metabolic 6.7% (3), and eclampsia 6.7% (3). 62% of the seizures due to CVA occurred in females. 38% of the seizures due to Neuroinfection occurred in females. 100% of the seizures due to Poisoning occurred in females (all occurred in females). Among CVA (n=18), Majority of seizures were because of CVT 61% (11), followed by infarct 16% (3) and haemorrhage 16% (3).All the seizures due to CVT occurred in females, and all were postpartum. 31% of seizures were pregnancy related.

Table 2- Etiologies according to sex distribution

Etiology	Male (n=55)		Female (n=45)		Total (n=100)	
	No	% among males	No	% among females	No	%
1.Neroinfection	21	38.2	13	28.9	34	34.0
2.CVA	11	20.0	18	40.0	29	29.0
Infarct	7		3			
Haemorrhage	3		3			
CVT	0		11			
SAH	0		1			
SDH	1		0			
3. Idiopathic	7	12.7	2	4.4	9	9.0
4.Metabolic	6	10.9	3	6.7	9	9.0
5.Tumor	4	7.3	2	4.4	6	6.0
6. Miscellaneous	6	10.9	0	-	6	6.0
7. Poisoning	0	-	4	8.9	4	4.0
8. Eclampsia	0	-	3	6.7	3	3.0

3.5. Association for etiology and type of seizures

GTCS (n=63) is the most common seizure. The M.C cause for GTCS is Neuroinfection (40%), followed by CVA (23%) and Idiopathic (13%). 59% of PSSG is caused by CVA. 47% is caused by space occupying lesion. 8% of seizures were SE. M.C cause is neuroinfection (38%). 3% of seizures were CPS. All causes are space occupying lesions. 1 patient had EPC due to Hypocalcaemia. Most of neuroinfection patients presented with GTCS (73%). 51% of CVA patients presented with GTCS followed by PSSG (34%). 56% of metabolic seizures were GTCS. All patients of poisoning presented with GTCS. 89% of idiopathic seizures were GTCS.

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Table – 3 Association for etiology and type of seizures

Etiology	Type of seizures						Total
	GTCS	PSSG	SE	SPS	CPS	PC	
1.Neroinfection	25	3	3	2	1	-	34
NCC	*6*	3	2		1		
Tuberculoma	*2*			1			
Others	*17*			1			
2.CVA	15	10	-	4	-	-	29
CVT	*7*	3		1			
INFARCT	*4*	4					
Haemorrhage	*3*	2					
Tuberculoma	*2*			1			
Others	*17*			1			
3. Idiopathic	8	-	1	-	-	-	9
4.Metabolic	5	1	1	1	-	1	9
5.Tumor	1	3	-	1	1	-	6
6. Miscellaneous	4	-	1	-	1	-	6
7. Poisoning	3	-	1	-	-	-	4
8. Eclampsia	2	-	1	-	-	-	3
Total	63	17	8	8	3	1	100

4.0. DISCUSSION

Seizures are common disorders found all over the world and are encountered frequently during medical practice in variety of settings.Presently CNS infections like malaria, meningitis, tuberculosis, HIV, neurocysticercos is account for significant number of cases in developing countries.Since these infections vary from region to region; etiology of seizure may also vary from region to region. In Indian subcontinent cerebral venous thrombosis is common in post-puerperal women presents with severe headache, low-grade fever and seizures. Single small enhancing CT lesions are frequently reported from India. Etiological spectrum of seizures in developing countries is different from developed countries.So this study on "seizures" was done to know the various etiologies of new onset seizures in adults in this region.The present study "Etiological study of new onset seizures" was carried out in the hospital attached to Vinayaka Mission's Medical College, Karaikal.One hundred cases of new onset seizures were selected as per the criteria mentioned in the materials and methods. The observations are compared with the

studies done by others on the same subject [10, 11].Etiological spectrum of seizures in different age group was significantly different in our study, when compared to Hauser*et al*., study. Seizures due to Neuroinfection were leading cause in age group of 15-35 years and 35-64 years in our study, whereas alcohol related seizure in Hauser*et al*., study. Seizures due to CVA occurred in 30% of patient in age group of 15-35 years because all the Cerebrovascular accidents were because of postpartum cerebral venous thrombosis which occurred in 2nd and 3rd decade [12, 13].

5.0 Conclusion

From the present study "Etiological study of new onset seizures" the following conclusions were made. 89% of seizures were acute symptomatic seizures in which underlying etiologies can be made. Majority of seizures occurred in patients < 50 years. Etiological spectrum of seizures were varied and included neuroinfection, CVA, Tumour, Metabolic, poisoning and alcohol withdrawal. Neuroinfection and Cerebrovascular accidents accounted for significant number of seizures in all the age groups. Neurocysticercosis is most common cause in Neuroinfection. Cerebral venous thrombosis is an important cause of acute symptomatic seizures among young patients with cerebrovascular diseases.

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Conflicts of interest

The authors have no potential conflicts of interest to disclose.

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