



CLINICAL AND ETIOLOGICAL PROFILE OF SEIZURES IN ADULTS

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KEYWORDS :**INTRODUCTION**

Epileptic seizures were described in ancient cultures, including those of China, Egypt, and India. The seizures were attributed to the God of the Moon and many supernatural powers. In fact the word "Epilepsy" is derived from a Greek meaning "to be seized by forces from without". Hippocrates wrote the first book on "Epilepsy" 2500 years ago. He rejected the ideas regarding the divine etiology and concluded the excessive phlegm causing abnormal brain consistency is the root cause.

Modern investigation for the etiology of epilepsy began with the work of Fritsch, Hitzig, Ferrier, and Caton in the 1870s. In 1929, Berger discovered that electrical brain signals could be recorded from the human head by using scalp electrodes; this discovery led to the use of electroencephalography (EEG) to study and classify epileptic seizures. Gibbs, Lennox, Penfield, and Jasper further advanced the understanding of epilepsy and developed the system of the 2 major classes of epileptic seizures currently used.

After a long circuit through ages of magic, black humours and black disinterest, medical thought has returned to the affirmation that epilepsy, like many other diseases, is root in natural causes. In terms of present day medical advances epilepsy is not cryptogenic, born of ignorance, but is merely a disturbance of the normal rhythm of the brain. In nature, rhythm is inherent; in man, dysrhythmia means disease; in brain, paroxysmal dysrhythmia spells epilepsy.

Epilepsy by definition is recurrent spontaneous seizures. Epilepsy must begin with first seizures but not all first seizures mean the beginning of epilepsy. There is a substantial difference in the distribution of syndromes in the fresh seizures when compared with a newly diagnosed epilepsy groups. Certain seizures types which are characteristic of specific syndromes are less likely to present to medical attention at the time of an initial event, such as absence, myoclonic, infantile spasms and complex partial seizures whereas generalized tonic clonic seizures are more likely to come to medical attention

AIMS & OBJECTIVES

To study the Clinical & Etiological Profile of 100 Adult cases admitted with Seizures in MIMS

MATERIALS & METHODS**INCLUSION CRITERIA-**

Cases aged more than 18 years admitted in MIMS with Seizures from May 2011 to May 2013 form the subjects of my study.

EXCLUSION CRITERIA-

- Cases aged less than 18 years
- Patients with Insufficient clinical data for diagnosis of seizures.
- A prospective analysis of 100 patients above 18 years with Seizures admitted in MIMS from May 2011 to May 2013 was performed.
- Detailed History & Clinical Examination
- Routine Investigations-CBP, ESR, RBS, RFT, Electrolytes, Calcium, Magnesium
- Special Investigations-CT/MRI/Spectroscopy, EEG, Mantoux

Test, CSF Analysis, Serum Anticysticercal Antibodies etc will be done whenever indicated

- The Diagnostic probability will be based on the Clinical data obtained from the patients charts & the results of the Imaging and/or EEG studies.

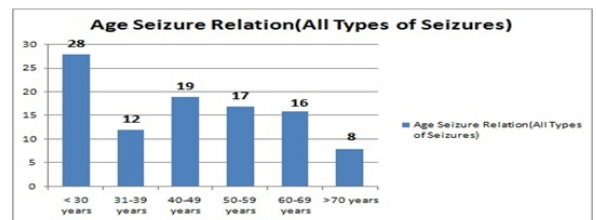
OBSERVATIONS & RESULTS

During the study period (May 2011 to May 2013) a total of 100 adult cases with seizures were studied.

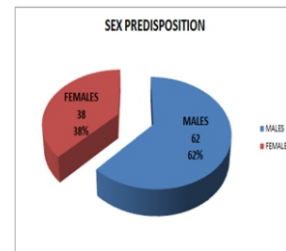
EPIDEMIOLOGY**TABLE I - SEIZURES ACCORDING TO AGE**

Age in yrs	No of cases	Percent
<30	28	28
31-39	12	12
40-49	19	19
50-59	17	17
60-69	16	16
>70	8	8
TOTAL	100	100

Seizures occurred commonly in the age group of 20 to 40 years amounting to 40% of the cases

**SEIZURES ACCORDING TO GENDER**

Of the 100 cases 62 were males (62%) and 38 were females.

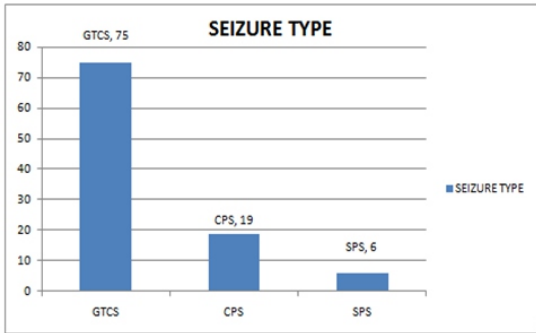
**SEIZURE TYPE****TABLE II - SEIZURE TYPE**

Seizure type	Number of patients N=100	Percentage
Primary Generalized	75	75%
Partial	25	25%

TABLE III - PARTIAL SEIZURES

Partial Seizure type	Number of patients N=25	Percentage
Complex partial	19	76%
Simple partial Secondarily generalized	6	24%

Of total 100 cases, 75 (75%) patients had Generalized seizures. Among the partial seizures 19 patients had Complex Partial seizures accounting to 76% of all partial seizures.



ETIOLOGY

TABLE IV - ETIOLOGY

ETIOLOGY	Number N=100	%
Vascular	19	19%
Infectious	34	34%
Tumor	1	1.0%
Metabolic	15	15%
Trauma	1	1.0%
Alcohol Related	17	17%
Cryptogenic	12	12.2%
Others	1	1%

There were 34 cases of CNS infections which formed most common cause of seizures in adults accounting for 34% of all seizures followed by vascular etiology accounting to 19% which included 4 cases of cortical vein thrombosis.

ETIOLOGICAL DATA

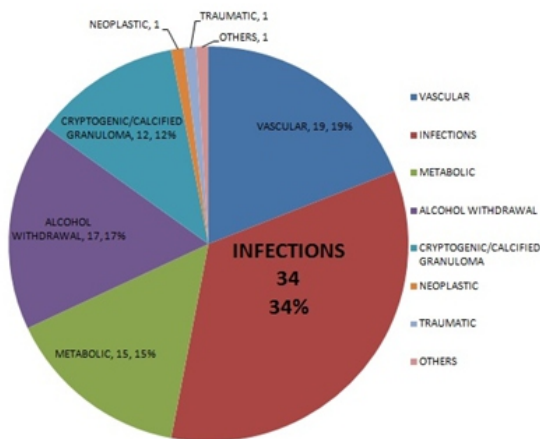


TABLE V - C.N.S Infections

Infectious Etiology	Number N=34	%
Tuberculoma	17	50%
TB Meningitis	2	5.88%
Neurocysticercosis	7	20.58%
Viral Meningoencephalitis	3	8.82%
Cerebral Malaria	4	11.76%
Others	1	2.94%

Among all CNS infectious there were 19 cases of CNS Tuberculosis in which 17 were CNS Tuberculomas and 2 were TB Meningitis and was leading cause accounting to 55.88% followed by 7 cases of Neurocysticercosis accounting to 20.58% of infectious etiology.

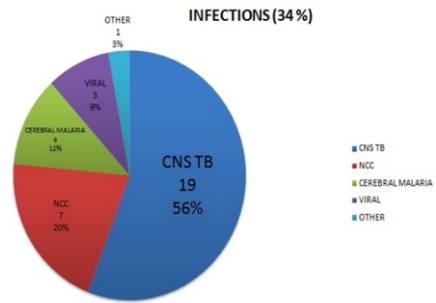


TABLE VI - DISTRIBUTION OF PROVOKED AND UNPROVOKED SEIZURES

ETIOLOGY	PROVOKED N=79	%	UNPROVOKED N=21	%
Vascular	10	12.82%	9	40.9%
Infectious	34	43.03%	0	0
Tumor	1	1.26%	0	0
Metabolic	15	18.98%	0	0
Trauma	1	1.26%	0	0
Alcohol	17	21.51%	0	0
Cryptogenic	0	0	12	54.54%
Others	1	1.26%	0	0

Of the 100 cases 79 patients (79%) had acute symptomatic seizures (provoked) and in 21 patients (21%) it was unprovoked.

Among provoked seizures CNS infection was the most common etiology accounting to 43.03%. Alcohol related causes formed 2nd most common cause of acute symptomatic seizures with 21.51% of all acute symptomatic seizures followed by Alcohol (21.51%), Metabolic (18.98%) & Vascular Causes (12.82%).

Among unprovoked seizures 12 Cryptogenic causes (54.54%) formed the most common cause followed by 9 cases (40.9%) which had a vascular etiology

TABLE VII - ETIOLOGY OF SEIZURES IN RELATION TO AGE

Etiology	Upto 40 yrs N=46	%	41-60 yrs N=39	%	>60yrs N=15	%
CNS Tuberculosis	11	23.9%	4	10.2%	4	26.6%
Other Infections	10	21.7%	4	10.2%	1	6.6%
Vascular	8	17.3%	9	23.0%	2	13.3%
Metabolic	3	6.5%	8	20.5%	4	26.6%
Alcohol Withdrawal	7	15.2%	8	20.5%	2	13.3%
Tumor	0	0	1	2.7%	0	0
Trauma	1	2.17%	0	0	0	0
Cryptogenic	5	10.8%	5	12.8%	2	13.3%
Others	1	2.17%	0	0	0	0

In the age group of upto 40 years CNS Tuberculosis was the most common cause of seizures with 11 cases accounting to 23.9% of all seizures in that age group. In the age group of 41-60 years vascular etiologies (23%) dominated followed by metabolic & alcohol withdrawal (20.5%) etiologies of all seizures in that age group. In the age group of above 60 yrs CNS Tuberculosis & Metabolic etiologies was the most common cause of seizures accounting for 26.6% of all seizures in that age group.

TABLE VIII - SEIZURE TYPE RELATION TO ETIOLOGY

SEIZURE TYPE	VASCULAR N=19 (%)	INFECTIOUS N=34 (%)	METABOLIC N=15 (%)	ALCOHOL N=17 (%)	Crypto/Others N=15 (%)
Primarily generalized	13 (68.42%)	21 (53.84%)	14 (93.33%)	17 (100%)	10 (66.67%)

Simple partial Secondarily generalized	2 (10.52%)	1 (2.54%)	0	0	3 (20%)
Complex partial	4 (21.05%)	12 (30.76%)	1 (6.67%)	0	2 (13.33%)

Most common seizure type secondary to vascular etiology was primary generalized accounting to 68.42%. Most common seizure type secondary to infectious etiology was primary generalized accounting to 53.84%. Overall observed data reveals a predomination of Primary Generalized Seizures accounting to 75% of the present study.

DISCUSSION

Most epidemiologic studies of seizure disorders are studies of the prevalence of epilepsy and in most of them, as in studies of the incidence of seizure disorders, information was collected retrospectively.

AGE	Present study N=100 (%)	K.S.Mani, Yelandur study ¹ N=14 (%)	R.Sridharan, Libiya ² N=75 (%)	Sankar.P, West Bengal ³ N=10 (%)	EPIMART - French island ⁴ N=213 (%)	Lars Forsgren, Sweden ⁵ N=98 (%)	Perre Jallon, Geneva ⁶ N=217 (%)
Upto 40 yrs	46 (46)	10 (71.4)	55 (73.3)	4 (40)	57 (26.6)	26 (26.5)	68 (31.3)
41-60 yrs	39 (39)	3 (21.4)	13 (17.3)	5 (50)	54 (25.2)	31 (31.6)	62 (28.5)
>60 yrs	15 (15)	1 (7.14)	7 (9.3)	1 (10)	103 (48.1)	41 (41.8)	87 (40.1)

In the present study seizures are more common in the age group upto 40yrs accounting to 46% of total cases, similar to other studies from India and other developing countries (In studies by Sankar.P Saha, West Bengal study³ 40% , study by K.S.Mani, Yelandur study¹ 71.4% and study by R. Sridharan ,libya² 73.3%).In contrast, studies form developed countries number of patients with seizures are more in age group >60yrs EPIMART4 (48.1%); Lars Forsgren5 (41.8%); Perre Jallon6 (40.1%).

Probable reasons for the variation could be In Developing countries & rural areas first seizure in elderly is often neglected.

Major population of India falls in the age group 21-40yr ,so number of patients with seizures in this group are more when compared to elderly(>60yrs).

TABLE X - SEIZURE DISTRIBUTION ACCORDING TO SEX
Incidence of seizure was higher in males in present study, with a male to female ratio of 1.63:1

Present study N= 100			K.S.Mani, Yelandur study ¹ N=14			EPIMART (French island) ⁴ N=214			Genev Perre Jallon, Geneva ⁶ N=217(%)		
M	F	Ratio	M	F	Ratio	M	F	Ratio	M	F	Ratio
62	38	1.63:1	7	7	1:1	141	73	1.93:1	127	90	1.41 :1

which is comparable with other studies

TABLE X1 - SEIZURE TYPE DISTRIBUTION

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Type of seizure	Present study N=100 (%)		Nadir.E. Bharucha Bombay ⁷ N=66 (%)	Sankar.P, West Bengal ³ N=38 (%)	Lars Forsgren Sweden ⁵ N=160(%)
Complex partial	19	(19%)	4 (6.06%)	8 (21.1%)	9 (6%)
Simple partial /Secondarily generalized	6	(6 %)	31 (48.48%)	4 (10.5%)	86 (54%)
Primarily generalized	75	(75%)	30 (45.45%)	21 (56.1%)	25 (16%)

Most common seizure type in our study was Generalized Seizures accounting to 75% of all seizure types differing to the studies by Nadir.E.Bharucha , Parsi community⁷ which had a higher incidence of Partial Seizures (56.4%); study by Lars Forsgren, Sweden⁸ which had a higher incidence of Partial Seizures (68%) and study by Nimal senanayake Srilankan study⁹ which also predominated in Partial Seizures (77.02%)

Among all causes of seizures CNS infections formed leading cause of seizure in adults accounting to 36% of all causes in present study. Cerebrovascular diseases formed 2nd most common cause with 19%. Among the CNS infections CNS Tuberculosis (Meningitis/ Tuberculoma) formed leading cause with 56% of all Infectious causes of seizures. Neurocysticercosis accounted for 20% of all Infectious causes of seizures in present study which differed from the study in which Neurocysticercosis, SCTEL and small single cerebral calcific CT lesion (SSCCCTL) together accounted for 40% of etiological factors in a study by J. M. K. Murthy and Ravi Yangala¹⁰. In present study patients with neurocysticercosis most commonly presented with complex partial seizures accounting to 57.14%. In a study by Alessandra Nicoletti¹¹ of 34 cases of NCC 21(61.76%) presented with secondarily generalization.

Most of the patients in the present study were from rural areas with endemicity of diseases like neurocysticercosis & tuberculosis, low socioeconomic status, and poor personal hygiene, may all contribute for higher percentage of infectious etiology of first seizure in present and other studies from developing countries. Most of the patients living in these areas are infected at younger age and become symptomatic with first seizure at a younger age. As the age increases risk factors for stroke (diabetes, hypertension, atherosclerosis.) increase contributing to higher percentage of stroke as a etiology of seizures in elderly.

In the present study of the 100 cases 79 patients had acute symptomatic seizures accounting to 79% and in 21 patients (21%) it was unprovoked. Acute symptomatic seizures occurred in 53% of patients in a study of localization related epilepsy by J. M. K. Murthy and Ravi Yangala¹⁰. In a study by Pierre Jallon⁶, acute symptomatic seizures represented 35.5% of total cohort. In studies by L.Forsgren acute symptomatic seizures accounted for 26.6%⁵ & 24.11%⁸ of all etiologies. As our hospital is a referral centre for surrounding areas the higher number of cases with acute symptomatic etiologies leading to hospitalization contrasts with the higher representation of unprovoked seizures cases in community based studies.

TABLE X11 - ACUTE SYMPTOMATIC SEIZURES

Etiology	Present study		Jaishree T.Narayan HYD ¹²		EPIMART - French island ⁴		Genev Perre Jallon, Geneva swiz ⁶	
	N=79	(%)	N=66	(%)	N=63	(%)	N=97	(%)
Vascular	10	12.65 %	16	24.2%	13	20.6%	18	20%
Infectious	34	43.03 %	21	31.8%	3	4.76%	6	6.6%
Tumor	1	1.26%	1	1.51%	6	9.52%	10	11%
Alcohol	17	21.51 %	6	9.09%	19	30.1%	29	29.8 %
Metabolic	15	18.98 %	21	31.8%	10	15.9%	26	26.8%
Trauma	1	1.26%			12	19%	2	2.2%
Others	1	1.26%						

In the present study among acute symptomatic seizures, CNS infections were the most common cause accounting to 43.03% of all causes, similar observation made in other Indian studies ,by JMK .Murthy; Jaishree T Narayan(31.8%)¹². In present study among acute symptomatic seizures CNS Tuberculosis accounted for 56% of CNS infections ,differing from observations were made by Jaishree T.Narayan¹²; JMK Murthy¹³ in which Neurocysticercosis was the most common infection probably due to the increased prevalence of Tuberculosis in our epidemiological rural setting compared to theirs.

In present study there were 17 cases with Alcohol related etiology (21.79%) formed 2nd most common cause of acute symptomatic

seizures followed by metabolic derangements similar to studies from developed countries in which alcohol related seizures were the most common cause EPIMART -French island⁴ 31.1% ; Perre Jallon, Geneva⁶28.9%.

In present study of 10 cases of vascular aetiology 4 were thrombotic (venous) and 6 were hemorrhagic (parenchymal) with no relation between haemorrhage/ thrombosis as cause of post stroke acute symptomatic seizures. A study by Reith et al¹⁴ has shown that the sub type of stroke per se does not influence the risk of early seizures. In present study there were only 4 cases below age 41 yrs with stroke as precipitating factor of acute symptomatic seizure and all had cortical sinus venous thrombosis. Cortical sinus venous thrombosis accounted for 40% of vascular causes of acute symptomatic seizures. In a study of acute symptomatic seizures by J. M. K. Murthy and R Yangala¹³ cortical sinus venous thrombosis accounted for 37% of strokes.

TABLE XI11 - UNPROVOKED SEIZURES

Etiology	Present study		J.M.K.Murthy HYD ¹⁵		Marco T, Rural Honduras USA ¹⁶		Genev Perre Jallon, Geneva ⁶		Lars Forsgren-Sweden ⁸	
	N=21	%	N=1,117	%	N=33	%	N=142	%	N=84	%
Vascular	9	42.85%	296	26.4%	2	6.06%	29	20.4%	30	35.71%
Cryptogenic	12	57.14%	0	0%	12	36.4%	80	56.3%	40	47.62%

Among Remote symptomatic seizures Cryptogenic are most common etiology (57.14%) in present study, differing to studies by JMK Murthy¹⁵(48.8%)& Marco T.Medina .in Rural Honduras USA¹⁶ (57.6%) in which CNS Infections were the most common cause. In the present study all CNS Infections causing seizures were all Acute Symptomatic type.

Cerebrovascular diseases formed 2nd most common cause in present study. Studies from developed countries had maximum percentage of patients in whom no cause could be identified-cryptogenic, Perre Jallon, Geneva⁶(56.3%); Lars Forsgren Sweden⁸(47.62%). In our study cryptogenic cases formed 57.14% of unprovoked seizures.

CONCLUSIONS

1. Most common age group in which seizures were seen was 20-40 years (40%)
2. Most common Gender in which seizures were observed was Males (62%)
3. Most common Seizure Type overall was Generalized Tonic-Clonic (75%)
4. Most common Etiology causing Seizures was Infectious Etiology (34%) in which most common Infection being CNS Tuberculosis (55.88%) in which CNS Tuberculomas (89.5%) formed the majority
5. Most common cause for Provoked Seizures was Infections.
6. Most common cause for Unprovoked Seizures was Cryptogenic.

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