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A Study of New Onset Seizures in Age More Than 40 Years

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ABSTRACT

Aim of The Study: *To study the etiologic profiles of first onset seizures in patients aged more than 40 years of age. To analyze the age / sex distribution, presenting history, clinical findings and investigations at admission in the study group.*

Material & Methods: *The study was done in the setting of Rajah Muthiah medical college and hospital, Annamalai university. The study was observational in nature designed to analyze patients in age group more than 40 years of age and who presented with first onset seizures from September 2012 to September 2014. The sample size was 68.*

Results: *The mean age of study patients was 9.79 years 62% of study patients were male and 38% were female. The majority of patients (71%) had Generalized seizure.CVA was the major factor for occurrence of seizure (37%) and which is followed by Tumor (16%). Metabolic factor was responsible for 12% of seizure and each of 10% of onset of seizure was due to Unidentifiable cause and Alcohol withdrawal. Granuloma was responsible for 6% of seizure in the current for study and Encephalitis and Meningitis are responsible for occurance of seizures in 3% of patients. Subdural hemorrage accounts for another 3% of seizures.*

Conclusion*: In a patient with new onset seizures more than 40 years, all efforts to identify the etiology should be made. Given the age of patients with a seizure more than forty years does not exceedingly favor any specific etiology. Thorough search to rule out metabolic factors as cause seizures should be an early priority. CT brain and MRI are indispensable in patients more than 40 years with new onset seizures.*

INTRODUCTION

Seizures have been recognized since antiquity. One of the earliest descriptions[1] of a secondarily generalized tonic-clonic seizure was recorded over 3000 years ago in Mesopotamia, which was attributed to the god of the moon. The word seizure is derived from Latin word "sacire", meaning, "to take possession of" indicating that the person having a seizure is possessed or atleast out of control[2]. The clinical symptoms in seizures could be motor, sensory, autonomic, or psychic events although in practice, when a patient presents to a health care system with a seizure it is usually a convulsive (motor) seizure, either generalized or focal.

Cumulative observations of many clinical investigators, along with adjunctive neurophysiological, imaging and genetic tools created a well-accepted diversity in the etiologies of seizures in various age groups. Interstingly, the highest incidence of seizures occur in early childhood and late adulthood. In older adults and elderly the frequent causes are cerebrovascular disease, brain tumors, alcohol withdrawal, metabolic disorders, degenerative diseases and idiopathic.[3] With aging population growing in our nation, thanks to improved medical infrastructure, a growing number of elderly people will be seeking attention to our health care system. This study is to analyze the seizures occurring in age the group of more than 40 years.

AIM OF THE STUDY

To study the etiologic profiles of first onset seizures in patients aged more than 40 years of age.

To analyze the age / sex distribution, presenting history, clinical findings and investigations at admission in the study group.

MATERIALS AND METHODS

The study was done in the setting of Rajah Muthiah medical college and hospital, Annamalai university.The study was observational in nature designed to analyze patients in age group more than 40 years of age and who presented with first onset seizures from September 2012 to September 2014. The sample size was 68.

INCLUSION CRITERIA

- Patients who presented with first onset seizures over the age of 40 years admitted in our medical unit.
- Inpatients, who developed first seizure in this hospital.
- Time between seizure and presentation to us within 15 days.

EXCLUSION CRITERIA

- History of trauma
- History of ingestion of toxins.

DATA ANALYSIS AND RESULT

The data was analysis using statistical package for social science (SPSS-21). The study sample consists of 68 patients who had developed 1st time seizure. All the participants were 40 years and

above. The basic statistics such as frequency tabulation was presented for the data on age, gender, symptoms and signs of seizure, type of seizure and etiological factors. The study aims to identity etiological factors for onset of seizure after 40 years.

Table – 1, Age Distribution

AGE (In Years)	NUMBER OF PATIENTS			PERCENTAGE
	M	F	TOTAL	
40 – 50	8	5	13	19
51 – 60	11	12	23	34
61 – 70	18	8	26	38
71 – 80	3	1	4	6
81 and above	2	-	2	3
Total	42	26	68	100

Table – 2, Type of Seizure

SEIZURE TYPE	NUMBER OF PATIENTS			PERCENTAGE
	MALE	FEMALE	TOTAL	
GENERALIZED	32	16	48	71
PARTIAL	10	10	20	29
TOTAL	42	26	68	100

In table 2, Types of seizure is presented. 71% of patients in the present study were affected from Generalized seizure and 29% are presented with partial seizure.

Table 3.Abnormal CT Findings

CT FINDING	NUMBER OF PAIENTS			PERCENTAGE
	MALE	FEMALE	TOTAL	
INFARCT	12	7	19	28
CORTICAL ATROPHY	9	2	11	16
TUMOR	7	2	9	13
PARENCHYMAL HEMORRHAGE	3	1	4	6
RING ENHANCING LESION	2	1	3	4
SUBDURAL HEMORRHAGE	1	1	2	3

In Table 3, Abnormal CT are reported. CT finding was done for all the study patients. Infarct was defected for 28% of patients and cortical atrophy was the finding in 16% of patients. 13% of patients were presented with Tumor and Parenchymal Hemorrhage was observed in 6% of patients. 4% patients had ring enhancing lesion and 3% of patients were presented with subdural Hemorrhage.

Table 4, Abnormal MRI Findings

MRI FINDINGS	NUMBER OF PAIENTS	PERCENTAGE
TUMOR	2 (female)	8
INFARCT	2 (male)	8
ENCEPHALITIES	2 (male)	8
GRANULOMA	1 (female)	4

In table 4, details of MRI finding are presented. For 8% of patients Tumor was identified and again for each of 8% patients Infarct and Encephalities was identified in MRI. Granuloma was confirmed for 4% of study patients.

Table – 5, Etiological Factors

ETIOLOGY	NUMBER OF PAIENTS			PERCENTAGE
	MALE	FEMALE	TOTAL	
CVA	17	8	25	37
TUMOR	7	4	11	16
METABOLIC	5	3	8	12
UNIDENTIFIABLE	5	2	7	10
ALCOHOL WITH DRAWAL	5	2	7	10
GRANULOMA	2	2	4	6
ENCEPHALITIS	2	0	2	3
MENINGITIS	2	0	2	3
SUBDURAL HEMORRAGE	1	1	2	3
TOTAL	46	22	68	100

In table 5, Etiological factors for first time onset seizure after 40 years in the present study is provided. CVA was the major factor for occurrence of seizure (37%) and which is followed by Tumor (16%). Metabolic factor was responsible for 12% of seizure and each of 10% of

onset of seizure was due to Unidentifiable cause and Alcohol withdrawal. Granuloma was responsible for 6% of seizure in the current for study and Encephalitis and Meningitis are responsible for occurance of seizures in 3% of patients. Subdural hemorrage accounts for another 3% of seizures.

DISCUSSION

The study group comprised of 62% males and 38% females.Most authors report a small-to-moderate preponderance of men in their studies of first seizures in adults (van Donselaar20, 1992; Musicco, 1997; Hopkins18, 1988; King, 1998). A male to female ratio of 1.6: 1 is observed in this study, a trend noted in other studies. Analyzing the age groups in this study the maximum incidence of first onset of seizures is found in the age interval of 60 to 70 years. Studies have shown that incidence of new onset seizures above age 65 is even higher than first year of life – 135 per 100000 vs. 79 per 100000. The mean age for most of the common etiologies in this study was around 61 and hence, the age of a given patient with new onset seizure does not favor any particular etiology. The less common etiologies in this study, granulomas and meningitis however occurred around 50 years of age. The highest mean age encountered in this study was for cerebrovascular accident.

The seizure type classified in this study as per International League Against Epilepsy-revised classification of epileptic seizures revealed generalized seizure in 71% and partial seizure in 29%. Zhu PG studied new onset seizures in the ages between 20 and 80 revealed generalized seizures in 64% and partial in 30%.Retrospective study of Perez et al in 250 patients with late onset seizures revealed 59% generalized and 41% partial in nature.The observation of seizure types in this study is almost similar to the above-mentioned studies.In contrary, a recent study of Prego-Lopez M, Devinsky O identified partial seizures as the most common seizure type in adults

The table comprises of seizure type encountered in this study with various studies.

Seizure type	This study	Zhu PG[5]	Perez et al [6]
Generalized	71%	64%	59%
Partial	29%	30%	41%

The grey area in relying on history in classification of seizures is in the fact that the focal onset of a seizure is often missed and witnesses' attention is often drawn to the person only after an event becomes generalized.

Limb weakness and headache were the most common non-convulsive symptom, which the patients / attenders complained at admission. Fever presented at admission in 12% of patients in this study. It is important here to reemphasize that fever is one of the provocating factors for seizures. Vomiting presented in 90% at the time of seizures in patients.Post ictal confusion was the most frequent factor present in the history to suggest organicity. A history of alcohol intake, in most of the days of a week for more than ten years was present in 20% of patients.

Previous history of diabetes was present in 15 patients, two of whom presented with hypoglycemic seizures. One patient presented with seizures associated with a nonketotic hyper osmolar state.Motor system abnormalities and cranial nerve abnormalities were the most common neurological signs present at the time of admission. It was the motor system abnormality in clinical examination, which most frequently predicted an abnormality in the CT scan. Only one patient admitted with status epilepticus. Signs of meningial irritation were present in four patients with tumor etiologies and three patients with CVA besides presenting in all patients with meningitis. Metabolic abnormalities contributed to etiology in 12% of patients and most of them were readily treatable, hence a thorough search for these factors should be the early priorities. The most common metabolic abnormality was hypoglycemia which was often encountered as an associated finding with other etiologies.The study 15 patients to have Type 2 diabetes, 11 to have hypertension and three to have both. Renal failure was detected in two of the patients in the group.

EEG was done in 38(56%) of the 68 patients in the study. Abnormalities were found in 18(46%) of the EEG's done. The yield of abnormalities in the EEG in this study could have been better if it were done more early or special methods such as continuous EEGs and sleep deprived EEGs were adopted[4]. The most common abnormality in EEG was diffuse slowing of background activity. Anti-convulsant drugs slow the normal background rhythm in EEG[3] and almost 80% of the patients in the study group were under the anti convulsant drugs when EEG was performed, which explains the predominance of diffuse slowing pattern in the EEG.

When the other investigations were inconclusive, "focal findings in the EEG originating from the temporal lobes" were recorded in two patients, which helped in the diagnosis of encephalitis. CT scan was done in all patients in the study group, in which the abnormalities contributed to the etiologies in 43% of patients. Cerebral vascular accident (34%) was the most common abnormality present in the scan report but had no relevance with any etiology. Abnormal CT findings in this study included atropy (16%), tumors (13%), parenchymal hemorrhage (06%), granulomatous lesion (04%) subdural hemorrhage(03%),CT findings in the study of new onset seizures by Sayette V[35] et al after the age of 50 found cerebral atrophy in 29%, CVA in 75%, tumors in 5%.The spectrum of CT findings is almost similar to our study except for the low incidence of tumors.

In the study of Zhu PG32, CT scan findings were compatible with CVA in 16%, tumors in 13%, atrophy in 7% and trauma in 8%. This study was done in age group ranging from 20 to 87 years. The inclusion of lesser age groups in this study explains the lower incidence of cerebral atrophy in CT scans.MRI despite improving the descriptions of lesions already studied in CT scans was instrumental in uncovering new lesions in nine of the patients in the study, in whom all other investigations were otherwise normal. The new lesions uncovered were tumors, encephalitis, infarcts in two patients each and granuloma in

one patient.Etiologic profiles revealed CVA, tumors, metabolic causes, and alcohol withdrawal seizures contributing to 75% in this study. CVA was the single most common etiology uncovered in this study.In the Minnesota study, the most prevalent underlying condition accounting for seizures in the elderly was stroke. Of the patients in the CVA group, 13 had infarcts and five had hemorrhages. Nine patients presented with acute CVA and seizures, whereas five had delayed post stroke seizures.Lesser and coworkers suggested that the acute and delayed post stroke seizures have different mechanism, the former related to "transient cytotoxic metabolic alterations" and latter to structural changes, especially extravasations of blood and deposition of iron.Tumors contributed to 16% of etiologies in this study. Tumor as etiology in various studies are as follows, Montréal neuro institute 36% (study age over 50),mayo clinic 22% (study age over 60), Liege Belgium study (age 55 to 64) 21%, Glasgow Scotland 12% (study age - elderly) and Denever general hospital 1% (study age over 69). Tumor as etiology in older patients lies between 1% and 36% invarious studies and the result of this study (16%) lies somewhere in the midpoint of this spectrum.In 10% of patients in this study, etiology could not be determined. This significant proportion of seizures in the elderly that remain idiopathic raises the possibility that age-related changes in the brian lower seizure threshold. Also these could be the cases of late onset epilepsies,Hyponatremia, hypoglycemia, hyperglycemia and renal failure contributed to 12% of seizures in the study. They were the most readily treatable causes, especially those patients detected to have hypoglycemic seizures. Hence a review at the metabolic parameters at admission is mandatory and when detected is most rewarding for the treating physician.History was the tell tale evidence in patients diagnosed to have alcohol withdrawal seizures which formed 10% of etiologies.Granulomatous etiology for first onset seizure was found in six percent of the study group. The significant point about this group was that their mean age of occurrence was the least in this study (46 years).Meningitis and subdural hemorrhage in total contributed to six percent of the total etiology. Both the meningitis in this study were of tuberculous etiology.Unlike seizures in the young etiologies could be established in most of the new onset seizures in age above 40 years.

SUMMARY OF RESULT

The mean age of study patients was 9.79 years 62% of study patients were male and 38% were female. The majority of patients (71%) had Generalised seizure.Limb weakness (68%) and head ache (43%) were the common non convulsive symptoms at admission.Postictal confusion (63%) and tongue bite (38%) were the common history of patients with seizure.22% of study patients have known diabetes and 16% of patients were hypertension. Further 4% of patients have both diabetes and hypertension.The common Neurological sign of patients with seizure in the current study was motor system abnormalities (40%). Hypoglycemia was reported in 4% of patients and 3% of patients had metabolic

acidosis. The common etiological factor of seizure in the current study was CVA (37%) the next common between factor was Tumor (16%).The was no association between Age, Gender on etiological factors of seizure.

CONCLUSION

Unlike in young, most of the seizures in the age group studied, had their etiologies established. Hence, in a patient with new onset seizures more than 40 years, all efforts to identify the etiology should be made. Given the age of patients with a seizure more than forty years does not exceedingly favor any specific etiology. Thorough search to rule out metabolic factors as cause seizures should be an early priority. CT brain and MRI are indispensable in patients more than 40 years with new onset seizures.

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