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Clinical and etiological study of new onset seizures in elderly

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Abstract

Background: With increasing age, the prevalence and incidence of epilepsy and seizures increases correspondingly. New-onset epilepsy in elderly people often has underlying etiology, including cerebrovascular diseases, primary neuron degenerative disorders, intracerebral tumors, and traumatic head injury.

Objectives: To study the clinical profile and etiology of new onset of seizures in elderly.

Material and Methods: A prospective study of 75 cases of epilepsy who fulfilled the following criteria. The inclusion criteria were epilepsy diagnosed according to ILAE classification, Age of onset >60 years. Exclusion criteria were Age of onset <60 years.

Results: Majority of patients belonged to the age group of 60- 83 years. Male: Female ratio was 1.4:1. Etiological analysis- idiopathic (13.3%), poststroke epilepsy (41.3%), metabolic (18.6%), alcohol related (10%), posttraumatic (5.3%), brain tumor (8%), brain infection (2.6%) and most common type focal motor impaired/complex partial seizures.

Conclusion: Epilepsy beginning in elder life requires special attention with respect to its etiology. Cerebrovascular disease was the most common etiology after 60 years of age whereas metabolic, alcohol withdrawal were other common etiologies and complex partial seizure/focal motor with impaired cognition was the most common type of seizure.

Keywords: Late onset epilepsy, Cerebrovascular disease, metabolic seizures, complex partial seizures

1. Introduction

The general perception is that seizures occur most often in infants but rarely in older adults. However, population based studies indicate that seizure disorders increase in incidence and prevalence after the age of 60 years^[1, 2]. Epidemiologic studies consistently document an increased incidence of seizure disorders in older adults and suggest that aging is a definite risk factor^[3]. Elderly people are the most rapidly growing segment of the population. The incidence and prevalence of epilepsy are higher in this age group than in younger people. Elderly individuals with epilepsy are a unique subpopulation of patients with several important differences from younger people with epilepsy^[4]. The literature indicates that epileptic seizures are often difficult to diagnose in the elderly for various reasons, such as difficulty in obtaining an accurate clinical history, a frequently atypical ictal presentation, and difficulty in diagnostically distinguishing between an epileptic and non-epileptic event^[5].

There also appears to be differences in this patient group in the epidemiology, etiology, and treatment with antiepileptic drugs in developing countries compared to developed countries^[4]. In many older patients, an underlying cause of seizure activity is clearly identifiable. Epidemiologic studies have defined acute symptomatic seizures as those that happen in the context of an acute insult to the central nervous system (CNS) or during an acute metabolic disturbance^[3, 6]. These seizures are associated with subdural hematoma, stroke, and CNS infection. They also can occur with systemic metabolic conditions such as uremia, hyperglycemia, hypoglycemia, hyponatremia, and alcohol withdrawal. A five-year study^[7] of 151 patients with a first seizure after 60 years of age found that 32 percent of the seizures were caused by strokes and 14 percent by brain tumors, including meningiomas, malignant gliomas, and brain metastases; 25 percent had no identifiable cause.

A community cohort study^[8] of 675 patients with a first stroke found that the risk of having a seizure was 2 percent at stroke onset and 11 percent in the first five years after the stroke. Seizure recurrence after a stroke can be immediate, or it may happen for several years^[9]. Recurrences are more common after hemorrhagic or severe ischemic strokes with cortical (particularly occipital) involvement^[8, 10]. Of the degenerative disorders, Alzheimer's dementia and amyloid angiopathy are known major causes of seizures^[11]. Advanced Alzheimer's disease has been identified as a risk factor for new-onset generalized tonic-clonic seizures in older adults^[12]. An increased prevalence of seizures also has been documented with other types of dementia^[11]. Status epilepticus has been defined as a single generalized seizure lasting more than five minutes or a series of seizures lasting longer than 30 minutes without the patient regaining consciousness.

The greatest increase in the incidence of status epilepticus occurs after the age of 60 years^[13]. The most dramatic clinical presentation is generalized convulsive seizures. Because people are living longer and are more likely to have concurrent medical illnesses requiring multiple medications, family physicians are increasingly challenged to provide appropriate management of seizures and monitoring of antiepileptic drug therapy in their older patients. In this review, we have focused on analyzing the causes of new-onset seizures and most common type of seizure in elderly people.

Materials & methods

Source of data

Seventy five patients above 60 years of age admitted with new onset seizures from the hospital attached to SCB medical college and Hospital, Cuttack, who fulfilled the inclusion and exclusion criteria as mentioned.

Study period

Study began on January 2018 and ended on June 2019.

Methods of collection of data

Patients above 60 years of age presenting with history of new onset seizures were included in the study. Patient and eyewitness were interviewed regarding history, and clinical examination was done as mentioned in proforma. The investigations included haemoglobin level, total count, differential count, ESR, urine routine, blood urea, serum creatinine, blood glucose levels, and estimation of serum electrolytes like sodium, potassium, and calcium. Special investigations like lumbar puncture, serological tests, CT scan brain, MRI-brain, EEG were done in selected cases.

Statistical method and software

The collected data was analysed 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.

Inclusion criteria

1. Age of patients more than or equal to 60 years.
2. Patients presenting with new onset seizures.

New onset seizure is defined as the first seizure (or the first cluster of seizures with in 24 hour period) ever experienced by the patient.

Exclusion criteria

1. All patients with seizures <60 years of age
2. Patients with past history of seizures in <60yrs.

Results

Table 1: Age and sex distribution

Age group (years)	Males		Females		Total	
	No	%	No	%	No	%
60-64	16	36.4	15	50	31	40
65-69	6	13.6	8	25	14	16.67
70-74	12	27.3	8	25	20	26.67
75-79	4	9.1	0	0	4	6.67
>80	6	13.6	0	0	6	8.34
Total	44	100	31	100	75	100

- In the present study patients age ranged from 60 years to 83 years, with mean of 62 years.
- Majority of the patients were in the age group 60-64 years (n=31, 40%), followed by 70-74 years (n=20, 26.67%), 16.67% (N=14) belongs to age group 65-69years, 6.67% (n=4) belong to 75-79 age group, 8.34% (n=6) belong to more than 80 years.
- 83.34% of the patients were in the age group 60-74 years. 16.63% were in the age group 75 years and above.
- Out of the 75 patients 44 were male and 31 were females, with male to female ratio of 1.4:1. Majority of the males and females were in the age group of 60-64 years.

Table 2: Distribution of etiologies of people with seizures

Etiology		Number (n=75)	Percentage
STROKE (n=31)	INFARCT	20	26.6
	ICH	9	12
	SAH	2	2.6
Metabolic disturbance (n=14)	HYPONATREMIA	10	13.3
	HYOGLYCEMIA	2	2.6
	HHS	2	2.6
HEAD TRAUMA (4)	SDH	4	5.3
CNS Tumor (6)	Primary brain tumor	4	5.3
	Secondary brain tumor	2	2.6
CNS INFECTION	Bacterial meningitis	2	2.6
Alcohol RELATED	Alcohol withdrawal	8	10.6
Idiopathic	idiopathic	10	13.3
Total		75	100

CVA/Stroke is the major etiology of new onset seizures in above 60 years of age (n=31, 43.3%).among stroke CVA-infarct is the leading cause of seizures, which account for 26.6% (n=20), followed by ICH seen in 12% (n=9), SAH in 2.6% (n=2) cases respectively.

Head trauma accounts for 5.3% of seizures all 4 cases are SDH.

Metabolic seizures accounted for 16.67% (n=14), of which hyponatremia was 13.3% (n=10) hypoglycemia was 2.6% (n=2) and hyperglycemic hyperosmolar state was 2.6% (n=2).

In 10% of the cases the cause for seizures were alcohol withdrawal (n=8) Neoplasms (Cerebral metastasis) accounts

for 6.67% (n=6) among CNS tumors 5.3% (n=4) were due to primary brain tumors, 2.6% (n=2) due to secondary brain tumors respectively.

13.3% (n=10) of seizures doesn't have any specific etiology were defined as idiopathic seizures infections (bacterial meningitis) is other rare causes of seizures (n=2).

Table 3: Correlation of etiologies with age group

Etiology	Age in years					Total
	60-64	65-69	70-74	75-79	>80	
CVA-infarct	12	0	4		4	20
CVA-hemorrhage	5	1	1		2	9
SDH	2	2				4
SAH	1	1				2
CNS Tumor	1		4	1		6
HYPONATREMIA	1	5	2	1		10
Hypoglycemia	1		1			2
Hyperosmolar hyperglycemic state	1	1				2
Idiopathic	2	1	4	2		10
Alcohol withdrawal seizures	2	3	4			8
CNS infections	1		1			2
Total	31	14	20	4	6	75

60-64 years (n=31): Most common etiology is CVA-infarct 40% (12), followed by alcohol withdrawal seizures 8% (2) and idiopathic seizures 8% (2).

65-69 years (n=14): Most common cause is hyponatremia 36% (5), SDH 18.1% (2), CVA- hemorrhage and hyperosmolar hyperglycemic state 9.9% (1).

70-74 years (n=20): Most common cause is CVA-infarct, idiopathic, alcohol withdrawal seizures and CNS tumor (cerebral metastasis) 18.5% (4).

75-79 years (n=4): MOST common cause is idiopathic (n=2), then tumor & alcohol withdrawal 30% (1).

>80 years (n=6): Most common cause is CVA-infarct 66.7% (4) and CVA- hemorrhage 33.3% (2).

✚ 80% of seizures due to CVA infarct occurred between 60-74.

✚ 50% of idiopathic seizures occurred between 70-79 years.

✚ 50% of hyponatremia occurred between 65-69 years

✚ 85.7% of metabolic seizures occurred between 60-69 years.

✚ Seizures due to CNS Infection and SDH occurred between 60-69 years.

✚ 66.7% of alcohol withdrawal seizures occurred between 60-64 years

Table 4: Distribution of type of seizures

S. No	Type of Seizure	N	Percentage
1	GTCS/generalized onset motor	17	23%
2	PSSG/focal bilateral tonic clonic	10	13%
3	SIMPLE PARTIAL SEIZURES/focal aware motor	13	17%
4	STATUS EPILEPTICUS	2	3%
5	COMPLEX PARTIAL SEIZURES/focal impaired motor	23	31%
6	EPILEPSIA PARTIALIS CONTINUA	10	13%
	Total	75	100%

Among the new onset seizures studied most were complex partial seizures (focal motor impaired) (31%), followed by generalized tonic clonic seizures (23%), simple partial seizure (focal aware motor) seen in 17% of cases, focal to

bilateral tonic clonic seen & epilepsia partialis continua seen in 13% of cases, status epilepticus seen 3% of cases.

Complex partial seizures/complex motor impaired (CPS) is most common type of seizure Status epilepticus is least common type of seizure documented.

Table 5: Distribution of seizure types in according to sex distribution

Types Of Seizures	Males	Females
GTCS/generalized onset motor	11	6
PSSG/focal to bilateral tonic clonic	6	4
SIMPLE PARTIAL SEIZURES/focal aware motor	8	5
STATUS EPILEPTICUS	1	1
COMPLEX PARTIAL SEIZURES / focal motor impaired	14	9
EPILEPSIA PARTIALIS CONTINUA	4	6

➤ complex partial seizures/focal motor impaired is most common type in both male and females

➤ GTCS/generalized onset motor were more common in male (n=11) compare to female (n=6).

➤ Simple partial seizures most common in males (n=8)

Table 6: CT Brain in Seizures

S.No	CT Brain	No. of Patients	Percentage
1	NORMAL	31	35%
2	ABNORMAL	49	64%
3	NOT DONE	1	1%
	TOTAL	75	100%

64% of patients shows abnormal CT scan, among them most common finding is cerebral infarct 28.5% (14), followed by intra cerebral hemorrhage 18.3% (9).

Table 7: Distribution of CT Brain Findings in Seizure

CT Findings among the participants		
CT Findings	No	Percentage
Infarct	14	29
Calcified Granuloma	2	4
Gliotic Changes	3	6
Cerebral Edema	3	6
Space Occupying Lesion	6	12
Sdh	4	8
Sah	2	4
Intra Cerebral Hemorrhage	9	18
Others(periventricular ischemia, brain atrophy)	6	12
total	49	100%

Most common CT scan finding is infarction seen in 28.5% cases, followed by hemorrhage in 18%(n=9),12% of CT

scan shows ICSOL,9% of scans due to head trauma showing SDH findings

Table 8: Distribution of CT scan finding according to type of seizures

CT Findings VS Types of Seizures						
CT Findings	GTCS	PSSG	SPS	SE	CPS	EPC
Infarct	4	3	0	0	7	0
Calcified Granuloma	0	0	0	1	1	0
Gliotic Changes	2	1	0	0	0	0
Cerebral Edema	1	0	0	0	2	0
Icsol	1	0	2	0	3	0
Intra Cerebral Hemorrhage	0	0	6	0	0	3
Sah	0	0	1	0	1	0
Sdh	0	0	1	0	1	2
Others	2	1	1	0	1	1
Total	10	5	11	1	16	6

- In patients with generalised tonic clonic seizures, most common findings were cerebral infarct (n=4) & gliotic changes (n=2).
- Among patients who had partial seizures with secondary generalisation most common CT brain abnormality was cerebral infarct (n=3).

- In patients with complex partial seizures, most common findings was cerebral infarct (n=7).
- ICH is most common CT finding in patient with simple partial seizures (n=6).

Table 9: Association of etiology and type of seizures

Etiology	GTCS	PSSG	SPS	SE	CPS	EPC
CVA-infarct	9	0	0	0	11	0
CVA-hemorrhage	0	0	6	0	0	3
SAH	0	0	1	0	1	0
Head trauma	0	1	1	0	0	2
Hyponatremia	0	6	0	0	3	1
Hypoglycemia	0	1	0	1	0	
Hyperglycemic hyperosmolar state	0	1	0	1	0	0
Idiopathic	0	0	2	0	4	4
Tumor	0	1	2	0	3	0
Tubercular	0	0	1	0	1	0
Alcohol withdrawal seizures	8	0	0	0	0	0
Total	17	10	13	2	23	10

- ✚ Complex partial seizure is the most common type of seizure, seen in 33.3% (n=23) of patients.
- ✚ The most common cause for complex partialis seizures was CVA- infarct.

- ✚ 23% (17) patients had GTCS, Most common etiology is CVA infarct (n=9) & alcohol withdrawal (n=8).
- ✚ Most of the (58%)seizures due to metabolic abnormality were of PSSG, in that hyponatremia (n=6) is the most common metabolic abnormality

- ✚ All Alcohol withdrawal seizures were of generalized tonic clonic seizures.
- ✚ 60% of SPS were due to CVA (ICH) (n=6).
- ✚ Idiopathic seizures Belongs to CPS (n=4) &EPC(n=4) type.

EPC were most commonly seen in patients with history of head trauma & unknown etiology (idiopathic).

Discussion

Seizures in the elderly are recognized as frequent, and potentially difficult to diagnose. Their clinical features and relevant diagnostic problems still remain poorly investigated in hospital populations outside the setting of tertiary referral centers. Elderly seizures are diagnostically more problematic compared to earlier onset cases. This may relate to difficulties of obtaining accurate clinical histories, atypical presentations and frequent association with various co-morbidities, which all complicate differentiation between epileptic and non-epileptic events in the presence of any paroxysmal neurological episode. Acute seizures, epilepsy and status epilepticus have the highest incidences in those over the age of 60 as compared to all other age groups. The incidence of new onset epilepsy has been documented as 90 per 100,000 in people between 65 and 69 years of age, and increases to 150 per 100,000 in people older than 80 years. The prevalence rate of epilepsy at age 60 is 1%, and increases further with age.

So this study on “seizures in elderly” was done to know the various aetiologies of new onset seizures in elderly in this region. The present study “CLINICAL AND ETIOLOGICAL STUDY OF NEW ONSET OF SEIZURES IN ELDERLY PEOPLE” was carried out in the hospital attached to SCB MEDICAL COLLEGE, CUTTACK. 75 cases of new onset seizures in the elderly (>60 years) 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.

Etiological spectrum depends on age, sex, geography and medical setting.

In the present study patients age ranged from 60 years to 83 years, with mean age of 62 years.

Majority of the patients were in the age group 60-64 years (n=31, 40%), followed by 70-74 years (n=20, 26.67%). 83.34% of the patients were in the age group 60-74 years. 16.63% were in the age group 75 years and above.

Out of the 75 patients 44 were male and 31 were females, with male to female ratio of 1.4:1.

Majority of the males and females were in the age group of 60-64 years.

In the present study, Stroke was the leading cause of Seizure which accounted for 41% of cases, followed metabolic causes in 18%, alcohol related 10%, CNS Tumours in 8% and post head trauma in 5%, and no cause was found in 13% of cases. Stroke accounted for 41% of seizures in our study. Among these Ischaemic stroke (64.5%) was the commonest cause of seizures followed by Hemorrhagic stroke (29%), Sub arachnoid Hemorrhage (6%).

In the present study 31% of patients presented with CPS/focal impaired motor, 23% of patients present with GTCS. 37% of Stroke patients presented with CPS/focal impaired motor, 50% of CNS Tumor patients presented with GTCS, 30% of metabolic seizures were CPS and 40% of idiopathic seizures were CPS/focal impaired motor.

in our study “Complex partial seizure/focal impaired motor” is the most common type of seizure

Conclusion

Stroke, metabolic causes, Head trauma, alcohol withdrawal, neoplasms and infections were the etiology for the new onset seizure in above 60 years of age. Hyponatremia, Hypoglycemia, hyperosmolar hyperglycemic states were the metabolic causes for new onset seizures. Majority of the seizures were CPS followed by GTCS and PSSG. Majority of stroke was associated with CPS.

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