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Original Research Article

A Study of Clinical Profile of Seizure Disorder in Geriatric Population

Dr. Ravi Prakash Pandey,[1] Dr. Anurag Chaurasia[2], Dr. Sunil Ahuja[3], Dr. Panchalingppa Betageri[4], Dr. Manoj Indurkar[5]

[1]Assistant Professor Department of Medicine, SSMC $ SGM Hospital Rewa, MP, India
[2]Associate Professor Department of Medicine, SSMC $ SGM Hospital Rewa, MP, India
[3]Assistant Professor Department of Psychiatry, SSMC $ SGM Hospital Rewa, MP, India
[4]Postgraduate Student Department of Medicine, SSMC $ SGM Hospital Rewa, MP, India
[5]Professor$ HOD Department of Medicine, SSMC $ SGM Hospital Rewa, MP, India

***Corresponding author**
Dr. Ravi Prakash Pandey
Email: drraviprakashpandey@gmail.com

Abstract: Elderly people are the most rapidly growing segment of the population. The incidence and prevalence of seizure are higher in this age group than in younger people. However, population-based studies indicate that seizure disorders increase in incidence and prevalence after the age of 60 years. The aim of present study was to study the etiology and clinical profile of seizures in elderly patients (age>60yrs). All elderly patients (>60 years of age) presenting with new onset seizures admitted in Department of Medicine, S.S. Medical College and SGMH, Rewa, between March 2015 to May 2016 were included in this study. Relevant routine investigations including S. electrolytes and special investigations like lumbar puncture, serological tests, CT scan or MRI brain, EEG were done in selected cases. 100 patients presenting with seizures (62 male and 38 female) were assessed clinically and by routine and special investigations. In the present study, among type of seizures GTCS accounted for 51 cases, focal seizures in 49 cases and status epilepticus found in 4 cases. In the present study Stroke (43%) was the leading cause of seizure. Amongst stroke, Ischaemic stroke (58.13%) was commoner. The most common cause for GTCS (51% of all cases) was stroke (56.86%) followed by metabolic cause (13.72%). For focal seizure (49% of all cases) the most common cause was idiopathic 32.65% followed by stroke in 28.57%. Stroke is the most common cause of seizure in elderly population, followed by CNS Infections, Metabolic causes, CNS tumours and Idiopathic. Among stroke, seizures occur more commonly in ischemic stroke than in hemorrhagic stroke. Hence special emphasis should be made on prevention of stroke so that the incidence of subsequent seizures can be reduced.
Keywords: Stroke, Central Nervous System, Generalized tonic - clonic seizure, Focal seizure

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 hemorraghic 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.

AIMS AND OBJECTIVES OF THE STUDY

The present study titled *"study of clinical profile of seizure in geriatric patients"* was carried out in patients admitted in Department of Medicine, S.S. Medical College and Associated S.G.M. Hospital, Rewa (M.P.) from March 2015 to May 2016 with the following aims and objectives.

- To study clinical profile of seizures in elderly(age>60yrs)
- To study etiology of seizures in elderly patients.

MATERIALS AND METHODS

All elderly patients(age>60yrs) presenting with new onset seizures admitted to Department of Medicine, S.S. Medical College and SGMH, Rewa in between March 2015 to May 2016 were included in this study. Patient and eyewitness were interviewed regarding history and relevant clinical examination was done.

The investigations included 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 and potassium.

Special investigations like lumbar puncture, serological tests, CT scan or 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

All patients with seizures >60 years of age

Exclusion Criteria

All patients with seizures <60 years of age

- Seizures due to poisonings, drugs and alcohol.
- Patients with past history of seizures in <60yrs
- Patient with seizure like episodes
  - Hyperventilation
  - TIA
  - Narcolepsy
  - Movement disorder like choreoathetosis, tic disorder
  - Psychogenic seizures

RESULTS

The present study entitled "A Study of clinical profile of seizure in geriatric patients" was conducted in the Department of Medicine, S.S. Medical College and associated S.G.M. Hospital, Rewa (M.P.) from March 2015 to May 2016.

The study sample included 100 patients with seizures (62 male and 38 female). Each was assessed clinically and by routine investigations and special investigations. Most of the patients belonged to 70 yrs and above age group with mean age of 70.7+9.93. The

male to female ratio was 1.63:1. Majority of the patients studied belonged to the rural area (56%) compared to 44% from urban area. Most of the patients were illiterate 56% while 44% were literate in our study group. In the present study history of addiction was present in 58% of cases, and no addiction in 42% of cases. In the present study history of hypertension was found in 36 cases, history of DM in 13 cases, both DM and HTN in 13 cases, and no past history of DM/HTN in 37 cases. In the present study, among type of seizure at presentation GTCS accounted for 51 cases, focal seizures in 49 cases and status epilepticus found in 4 cases.

Stroke (43%) was the leading cause of seizure in the present study (Table 1). Amongst stroke, Ischaemic stroke (58.13%) was commoner than Haemorrhagic stroke (27.90%). In the present study CNS infections accounted for 14% of cases, out of which maximum number of seizures were due to meningitis (50%) (Table 1). The metabolic causes accounted for 12% of seizures, out of which, maximum number of seizures were attributed to hyponatremia (41.66%) (Table 1). In the present study CNS tumours accounted for 8% of cases and degenerative and miscellaneous accounted for 3% of cases. Abnormal EEG was present in 50% cases of focal seizure and in 44.44% of patients presenting with GTCS (Table 2). In the present study the most common cause for GTCS (51% of all cases) was Stroke in (56.86%) followed by metabolic in (13.72%) (Table 3). The most common cause for focal seizure in present study was (49% of all cases) Idiopathic 32.65% followed by stroke in 28.57% (Table 3). Neuro imaging abnormalities were observed in 71% of cases% (Table 4). In the present study, aspiration pneumonia (23%) was the most common complication followed by minor trauma (7%), cardiopulmonary arrest (2%) and Todd's palsy in (1%) of cases. In the present study total number of deaths seen were in 7% of cases. All mortality was from GTCS, no deaths were reported with focal seizures.

Stroke accounted for 43% of cases of seizure in elderly, CNS infections found in 14% of cases ,metabolic causes in 12% of cases, CNS tumours in 8% of cases, degenerative and miscellaneous in 3% of cases and no cause was found in 20% (idiopathic) (Table-2).

Focal seizure showed abnormal EEG in 50% of cases and in 44.44% of patients presenting with GTCS (Table-2).

Table 1: Distribution According To Etiology Of Seizure In Elderly

Etiology	Number and %
1. **Stroke (n=43)**	**43**
Ischaemic stroke	25(58.13%)
Haemorrhagic stroke	12 (27.90%)
Subarachnoid hemorrhage	3 (6.97%)
Subdural hematoma	3(6.97 %)
2. **Idiopathic (n=20)**	**20**
3. CNS Infection (n=14)	**14**
Meningitis	7(50%)
Cerebral malaria	4(28.57%)
Neurocysticercosis	2(14.28%)
Tuberculoma	1(7.14%)
4.Metabolic (n=12)	**12**
Hyponatraemia	5 (41.66%)
Hypoglycemia	3(25%%)
Uremic encephalopathy	2(16.66%)
Hyperglycemia	1(8.33%)
Hypernatraemia	1(8.33%)
5.CNS Tumours (n=8)	**8**
Glioma	4(50%)
Meningioma	2(33.3%)
Metastasis	2(16.66%)
6.Miscellaneous (n=3)	**3**
Neurodegenerative	2(80%)
NPH	1(20%)
Total	**100**

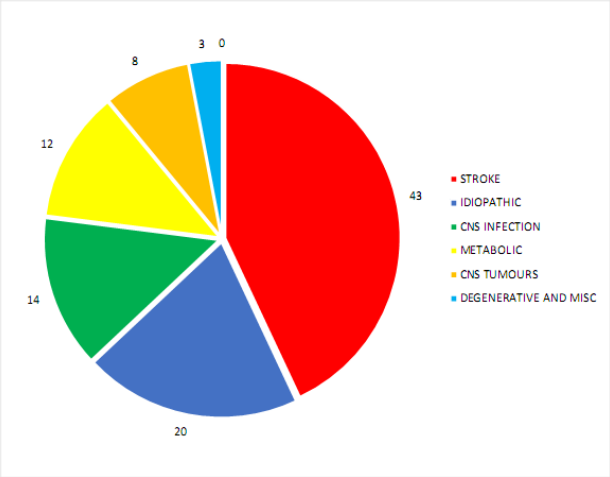

Fig-1: Etiology of seizure in elderly

Table 2: EEG Abnormalities In Different Types Of Seizure

S.No.	Types of seizure	EEG Finding		Total
		Abnormal EEG	Normal EEG	
1.	GTCS	4(44.44%)	5(55.55%)	9
2.	Focal seizure	1(50%)	1(50%)	2
	Total	5	6	**11**

N=11

Table 3: Association For Etiology And Type Of Seizure

Etiology	Type of seizure		Total
	GTCS(n=51)	**Focal seizure** (n=49)	
Stroke	29(56.86%)	14(28.57%)	43
Idiopathic	4(7.84%)	16(32.65%)	20
Metabolic	7(13.72%)	5(10.20%)	12
CNS Infections	6(11.76%)	8(16.32)	14
CNS Tumours	4(7.84%)	4(8.16%)	8
Misc. and Degenerative	1(1.96%)	2(4.08%)	3
Total	51	49	100

The most common cause for GTCS (51% of all cases) was Stroke in (56.86%) followed by Metabolic (13.72%) and CNS infections in (11.76%),

Most common cause for Focal seizure (49% of all cases) was idiopathic in 32.65% of cases followed by Stroke(28.57%).

Other causes like metabolic, CNS Infections, CNS Tumours showed almost similar rates of GTCS and Focal seizures.

Table 4: CT/MRI Abnormalities In Different Type Of Seizures

S. No.	Types of seizure	CT/MRI Finding		Total
		Abnormal	Normal	
1.	GTCS	41(80.39%)	10(19.60%)	51
2.	Focal seizure	30(61.22%)	19(38.77%)	49
	Total	71	29	**100**

Imaging abnormalities were observed in GTCS 80.39% of cases and in focal seizures abnormality found in 61.22% of cases. In total neuroimaging abnormality was observed in 71% of cases.

DISCUSSION

Seizures are common disorders found all over the world and are encountered frequently during medical practice in variety of settings.

Presently, cerebrovascular accidents account for significant number of cases of seizures in elderly. The present study was therefore conducted in 100 subjects admitted in Medical wards of Department of Medicine, S.S. Medical College and S.G.M. hospital, Rewa (M.P.). These subjects were meticulously studied for various parameters including the socio demographic profile, type of seizure, precipitating factors, clinical presentation, electroencephalographic, radiological and other relevant investigations.

Sociodemographic Profile

In the present study, patient's age ranged from 60 years to 100 years, with mean age of 70.7±7.55 yrs. The mean age at the time of entering the hospital was 69.9±4.9 years(range, 65-80 years) in a study by Sanjeev Thomas *et al* [15], and mean age of 66.25 ± 5.95 years seen in study by Binod Sarmah *et al* [14], which is comparable to our study.

Residence and Domicile

In the present study 56% individuals resided in rural area, whereas 44% in urban area. Maximum number of patients in our study were from rural areas because our population is rural dominated. The present study was a hospital based cross sectional study therefore the results of the study cannot be projected over the general population.

In the present study, positive family history of seizure was found in 2% of the cases and both of them had generalised seizure.

Clinical Profile

Etiology

In the present study, Stroke was the leading cause of seizure which accounted for 43% of cases, followed by CNS infection in 14%, metabolic causes in 12%, CNS tumours in 8% and degenerative and miscellaneous causes in 3%,and no cause was found in 20% of cases.

Stroke was leading cause of seizure in elderly occurred in 44.8% of cases in study by Binod Sarmah *et al* [14], 32% of cases in study by Lühdorf K *et al* [7], 33% of cases in study by Granger N *et al* [16], 53.9% of cases in study by Loiseau J *et al* [17].

Stroke accounted for 43% of seizures in our study. Among these Ischaemic stroke (58.13%) was the commonest cause of seizures followed by Hemorrhagic stroke (27.90%), Sub arachnoid hemorrhage (6.97%) and Subdural hematoma (6.97%).

Berges S *et al* [10] observed ischemic stroke as cause of seizure in 73% and hemorrhagic stroke in 27%. Bhojo *et al* [18] observed ischemic stroke as cause of seizure in 64.25% and hemorrhagic stroke in 35.71%.These results are comparable to our study.

In the present study, CNS infection occurred in 14% cases which was comparable to study by Binod Sarmah *et al* [14] in which CNS infections occurred in 11.7% cases and in 9% of cases in study by A.L. Viteau et al [19].

Metabolic cause was responsible for seizures in 11% of cases in Granger N *et al* [16] study, 7.8% in study by Binod Sarmah *et al* [14], 18% in study by A.-L. Viteau *et al* [19]. In the present study it accounted for 12% of cases.

Idiopathic cause was found in 16.3% of patients in Binod Sarmah *et al* [14] study, 22% in Granger N *et al* [16] study and 25% in Lühdorf K *et al* [7] study. In the present study, 20% of cases were found to be idiopathic, which is comparable to other studies.

Tumours occurred in 6.5% cases in study by Granger N *et al* [16], and in 14 % in study by Lourdes Vélez *et al* [20] and in 14% in study by Lühdorf K *et al* [7],12% in study by A.-L. Viteau *et al* [19], 6.5% of cases in study by Binod Sarmah *et al* [14]. In the present study, tumours were found to be responsible for seizures in 8% of cases. The findings of the present study are well in conformity of above mentioned studies.

Acute V/S Remote Seizures

Acute symptomatic seizures accounted for 76% of seizures in the present study whereas in the study by Sander *et al* [21] and Sinha *et al* [22] it was 57.8% and 15% respectively. Acute symptomatic seizures occur at the time of systemic insult or in close temporal association with a documented brain insult. Seizures are considered to be acute symptomatic if they occur in the first 7 days of illness.

In the present study, the cause for seizures could not be found in 20% of cases. Remote symptomatic seizures in the present study accounted for 4%. Prior cerebrovascular disease was the most commonly identified remote precipitant for new seizures. In the study by Sander *et al* [21] and Sinha *et*

al [22] study, it accounted for 21% and 18.8% of cases respectively.

Type of Seizure

In the present study 51% of patients presented with GTCS, 49% of patients present with Focal Seizures. 67% of Stroke patients presented with GTCS, CNS Infection patients presented with GTCS in 42% of cases, 50% of CNS Tumour patients presented with GTCS, 58 % of metabolic seizures were GTCS and 20% of idiopathic seizures were GTCS

In the present we found almost equal number of patients with GTCS(51%) and Focal Seizures(49%). Similar results were found by Binod sarmah *et al* [14] who in their study of 154 patients found 51.9% patients with partial seizures and 48.1% with GTCS.

A study by Ettinger *et al* [23] found equal percentage of partial and generalized seizures in 82 elderly patients with new-onset seizures.

CT/MRI Abnormalities in Different Types of Seizures

CT/MRI was done in all 100 patients, which revealed abnormalities in 80.39% (41 out of 51) cases of GTCS, 61.22% (30 out of 49) cases of focal seizures. In total neuro-imaging abnormality was found in 71% of cases in our study.

CT scans were abnormal in 68% cases in study by Holt-Seitz A, Wirrell EC, and Sundaram MB [24]. A study by Binod Sarmah *et al* [14] found CT abnormality in 61.7% of patients and MRI abnormality in 59.7% of cases which is comparable to our study.

Neuroimaging plays an important role in workup of patients with epilepsy. It helps to identify brain pathologies that require specific treatment; and also in formulating syndromic and etiological diagnoses for better assessment of clinical condition and prognosis of the patients.

Complications

In the present study, complications in seizure patients during hospital stay were aspiration pneumonia in 23%, minor trauma in 7%, cardiopulmonary arrest in 2% cases and Todds palsy in 1% of cases.

According to van den Broek M, Beghi E [25], reported that 24% accidents were seizure related. The risk was highest for concussions and abrasions. Patients with epilepsy were found to be at higher risk of accidents and their complications.

Mortality

In the present study, seven patients died. Out of these, all had GTCS**.** According to Aieden Neligan *et al* [26], people with epilepsy have an increased risk of premature death. The risk was highest soon after onset of seizures.

CONCLUSION

Stroke is the most common cause of seizure in elderly population, followed by CNS Infections, Metabolic causes, CNS tumours and Idiopathic. Among stroke, seizures occur more commonly in ischemic stroke than in hemorrhagic stroke.

Hence special emphasis should be made on prevention of stroke so that the incidence of subsequent seizures can be reduced.

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