ORIGINAL RESEARCH PAPER
Volume - 12 | Issue - 01 | January - 2023 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

CLINICAL AND ETIOLOGICAL PROFILE OF NEW ONSET SEIZURES IN ELDERLY PATIENTS REPORTING TO TERTIARY CARE CENTRE, NORTHEAST INDIA

Neurology

Dr Aritra Saha* Post Graduate Trainee, Department of General Medicine, Assam Medical College and Hospital, Dibrugarh, Assam. *Corresponding Author

Dr Krishnangshu Das Post Graduate Trainee, Department of General Medicine, Assam Medical College and Hospital, Dibrugarh, Assam.

Dr Mriganka Deka Post Graduate Trainee, Department of General Medicine, Assam Medical College and Hospital, Dibrugarh, Assam.

Dr Sudem Narzari Post Graduate Trainee, Department of General Medicine, Assam Medical College and Hospital, Dibrugarh, Assam.

Dr Ajit Kumar Pegu Professor & Head, Department of General Medicine, Assam Medical College and Hospital, Dibrugarh, Assam.

ABSTRACT

Background: Seizure disorder is a common neurological disorder among the elderly population and is associated with increased morbidity and mortality due to underlying comorbidities, weaker immunity and drug-to-drug interaction, but it does not get the adequate attention it deserves. **Methodology:** In a hospital-based retrospective observational study, 78 patients above 60 years, presenting with non-traumatic seizure for the first time, were included in this study. **Results:** The mean age of the study population was 70 years, with a male-to-female ratio of 1.84:1. The most common cause of seizure was a cerebrovascular accident (37%), followed by metabolic (24.3%) and infective causes (19.23%). Generalised type of seizure was more common than focal seizure (69% vs 25.5%). CVA was the most common cause of generalised seizure (38.16%) whereas, tubercular meningitis was the most common cause of focal seizure (10.2%). Hypertension was the most common comorbidity, followed by diabetes. **Conclusion:** The study emphasises the need for a holistic approach towards an elderly with seizure disorder and the need to control the comorbidities and thereby, its complications, such as seizure.

KEYWORDS

SECTION 1: INTRODUCTION

A disease that was first described as early as in 2500 BC from Mesopotamia, still remains one of the most common neurological disorder, with a prevalence of 3.0 to 11.9 % per 1000 population and an incidence of 0.2 to 0.6 per 1000 population per year (1,2). Seizure disorder is a commonly encountered medical emergency, accounting for 1% of hospital admissions and 3% of attendance in the emergency department (3). Seizure disorder has a bimodal distribution; with a peak in the children and elderly age group; however, adults are more likely to have an identifiable cause of seizure than children, which is primarily idiopathic, which is why adult-onset seizures deserve adequate attention(4).

Among adults, treating seizure disorder in the elderly is more challenging as this patient group tends to be more comorbid and more likely to have drug-to-drug interactions(5). It is a fact that successful treatment of seizure disorder begins with an accurate diagnosis. Determining the cause of the seizure is vital for choosing the correct treatment and provides a crucial idea regarding the duration of treatment and prognosis(6).

Among the elderly, the common causes of seizures are cerebrovascular accidents, trauma, central nervous system infection, metabolic causes etc. Despite the whole range of investigations available, the patient's medical history and a thorough physical examination remain the most important. Before proceeding to imaging modalities and electroencephalogram, the non-neurological causes of seizure should be ruled out (6,7).

Although seizure disorder is a common neurological ailment among the elderly in our country, there is a paucity of data from the northeastern region. Therefore, this study was done to understand the clinical and etiological profile of elderly patients presenting with seizure of non-traumatic origin.

2 MATERIALS AND METHODS:

2.1 AIM

To study the clinical and etiological profile of elderly patients with new-onset seizure of non-traumatic origin.

2.2 Inclusion Criteria

I. Age more than 60 years.
ii. Newly diagnosed seizure disorder, according to the IELS 2017 classification(8).

2.3 Exclusion Criteria

I. History of head trauma.
ii. Patients with incomplete evaluation.
iii. History of seizure.
iv. History of neurosurgery.

2.4 Study Design And Place

We conducted a retrospective, observational, hospital-based clinical and etiological study in our institute, Assam Medical College and Hospital, Dibrugarh, Assam.

2.5 Sample Size

One hundred thirteen (113) elderly patients with a seizure disorder were admitted from March 2021 to April 2022, but only seventy-eight (78) patients fulfilled the selection criteria.

2.6 Data Collection

Data was collected from the hospital registry of the patients admitted in the Department of General medicine and Department of Neurology, AMCH, for one year, from March 2021 to April 2022.

Patient records were analysed meticulously with particular attention to the patient's age, sex, past medical history, routine blood parameters such as serum electrolytes, serum glucose, total cell counts, neuro-imaging results such as CT-Scan and MRI of the Brain and EEG report. Patients with a history of head trauma, seizure episode in the past and patients whose evaluation was incomplete were not included in the study.

3. RESULTS

A total of 113 elderly patients with seizure disorder got admitted in our institute in the defined period between September 2020 and March 2022, of which 78 patients fulfilled the selection criteria of the study.

3. 1 Gender-wise distribution

In our study, 66% (51) of patients were male, and 34% (27) were female. (Fig.1)

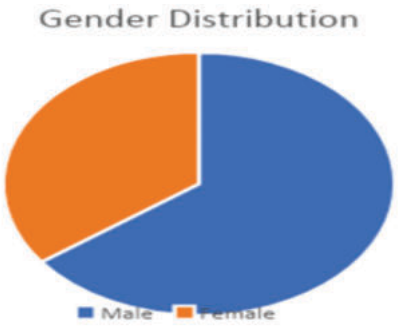

Figure 1: Gender Distribution

3.2 Age-wise distribution

Most patients were between 60-75 years; 79% (n=62) and 21% (n=16) belonged to the age group of more than 75 years. (Fig2)

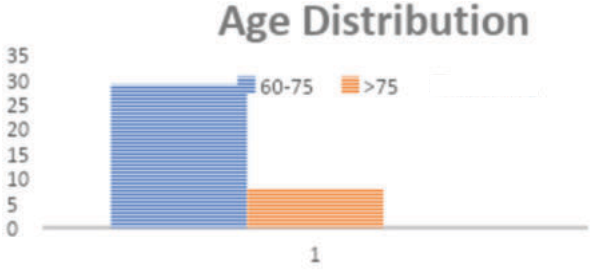

Figure 2: Age distribution

3.3 Type Of Seizure

Generalised tonic-clonic seizure (GTCS) was the most common type of seizure encountered at 94.5% (n=35). (Fig.3)

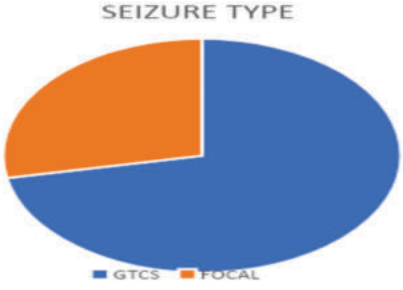

Figure 3: Type of seizure

3.4 Etiology

In our study, cerebrovascular accidents was the most common cause of seizure in the elderly age group (37.17%, n=29), followed by metabolic causes (24.35%, n=19), CNS infections (19.23%, n=15), CNS tumours (14.10%, n=11), PRES (1.28%, n=1) and idiopathic (3.84%, n=3).

The majority of the CVA patients had an intracerebral haemorrhage (24.35%), while infarct was the culprit in 10.25%. 24.35% of patients developed seizure due to metabolic causes, among which hyperglycaemia (HHS and DKA) was most common (11.53%), followed by hyponatremia (6.41%), hypoglycaemia (5.1%) and uremic (1.28%). Tubercular meningitis accounted for the majority of CNS infection cases (10.2%) followed by Neurocysticercosis (6.41%) and acute encephalitis syndrome (2.56%). Among the space-occupying lesions, metastatic lesions constituted 8.97%, followed by 5.1% cases of calcified granuloma.

One patient developed a seizure due to posterior reversible encephalopathy syndrome, whereas for two patients, no obvious aetiology could be pointed out; these patients accounted for 3.84% of the cases.

Table 1: Etiological profile of seizure in elderly

S.No	ETIOLOGY	PERCENTAGE %	NUMBER
1.	CVA	37.17%	29
	INTRA CEREBRAL HEMORHAGE	24.35%	19
	ISCHEMIC STROKE	10.25%	8
	SUBARACHNOID HEMORHAGE	2.56%	2
2.	METABOLIC	24.35%	19
	HYPERGLYEMIA	11.53%	9
	HYPOGLYCEMIA	5.1%	4
	HYPONATREMIA	6.41%	5
	UREMIC	1.28%	1
3.	CNS INFECTIONS	19.23%	15
	TUBERCULAR	10.2%	8
	NCC	6.41%	5
	AES	2.56%	2
4.	CNS TUMOURS/SOL	14.10%	11
	METASTASIS	8.97%	7
	CALCIFIED GRANULOMA	5.1%	4
5.	OTHERS	1.28%	1
	PRES	1.28%	1
5.	IDIOPATHIC	3.84%	3

Abbreviations:

NCC- Neurocysticercosis, AES- Acute encephalitis syndrome, PRES- posterior reversible encephalitis syndrome.

3.5 Etiology And Type Of Seizure

As mentioned in Fig 3 under Section 3.3, only 6.5% (n=2) patients had a focal seizure in our study group due to underlying calcified granuloma and ischemic stroke, respectively.

Figure 4: Etiology And Type Of Seizure

GTCS. (69%)	Intra Cranial Hemorrhage	24.35%
	Sub Arachnoid Hemorrhage	2.56%
	AES	2.56%
	Hyperglycemia	11.53%
	Hypoglycemia	5.1%
	Hyponatremia	6.41%
	Uremic	1.30%
	Ischaemic stroke	11.25%
	Idiopathic	3.84%

Focal seizure (25.5%)	Tubercular meningitis	10.2%
	Metastasis	3.8%
	Ischaemic stroke	5.1%
	PRES	1.28%
	Calcified granuloma	5.1%
Focal seizure with secondary generalisation (6.41%)	NCC	6.41%

3.6 Associated Comorbidities

Among 78 patients, 64 had comorbidities, of which hypertension was the most common (32.5%), followed by diabetes mellitus (29.48%). Coronary artery disease was present in 6.4% of patients, chronic kidney disease in 3.8%, whereas 8.97% of patients had underlying malignancy, of which three patients had lung cancer, two patients had breast cancer, and the other 2 had unknown primary. One patient was hypothyroid.

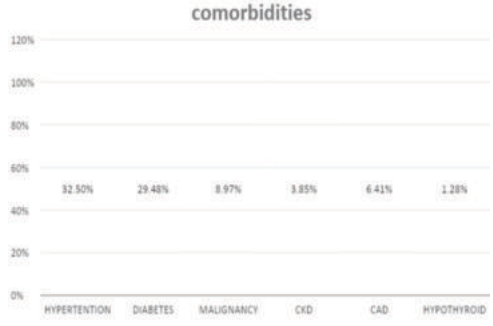

Figure 4: Associated Comorbidities In Elderly Patients With Seizure Disorder.

4. DISCUSSION

Seizure in the elderly requires special attention, considering the comorbidities that increase the risk of stroke and other factors such as

polypharmacy and altered drug excretion due to some underlying metabolic disorder(4). Apart from the medical causes, it is essential to realise that the fraction of the elderly age group is increasing worldwide. India is estimated to touch 194 million in 2031 from 138 million in 2021(9). With these concerns, this study was done to understand the clinical and etiological profile of new-onset seizure in elderly patients.

In the current study, out of the 78 patients, 79% belonged to the age group of 60-75 years and 21% above 75 years, with the average age of the first seizure episode being 70 years. The findings in this study are similar to the studies done in India {Verma et al.(10), Reddy et al.(11)} and outside {Lizbeth et al. (4)}. The decline in the prevalence of seizure in the latter group may be due to mortality associated increasing age along with lack of adequate awareness and transportation system, considering that our institute mainly serves the rural areas. In our study, the male-to-female sex ratio is 1.84:1, which is similar to the studies done by Kaur et al., Verma et al. and Reddy et al.(10–12). The difference can be attributed to the greater exposure of males to the risk factors of lesional epilepsy and acute symptomatic seizure (13)

Compared to focal seizure, the generalised seizure was the predominant subtype, which is comparable to other studies done in our country and other lower middle-income countries; however, focal seizure is more common in western countries, which has been attributed to the under-ascertainment of the various types of seizure probably due to lack of awareness and diagnostic tools (14).

Stroke remains the most common cause of new-onset seizure in elderly patients, a common finding in most studies done in the country and worldwide. Interestingly, in our study, intracerebral haemorrhage was a more common cause than ischemic stroke (10–12,15,16). Mahanta et al. have previously demonstrated in their study that intracerebral haemorrhage is the predominant type of cerebrovascular accident in this region of the country, contrary to what is in other parts of the country, as well as the world (17). Food habits and lifestyle has been implicated, especially more salt intake among the tea garden workers, which has resulted in a high prevalence of hypertension in this particular community, which forms a significant chunk of the patient footfall in our institute(18). Also, Bladin et al., in their multicentre prospective study, demonstrated that seizure occurs more commonly with haemorrhagic stroke than ischemic stroke(19).

In our study, the most common cause of generalised seizure was cerebrovascular accident CVA), followed by other causes such as metabolic, infective, and idiopathic, similar to the findings of the study done by Quraishi et al. (20) where CVA and infection was the most common cause of generalised seizure in adult patients, in contrary, idiopathic seizure was the most common in few other studies (21). Among our patients, tubercular meningitis was the most common cause of focal seizure, followed by ischaemic stroke and metastasis. In other studies by Kaur et al.(21), Sendil et al.(22), and Amaravathi et al.(23), ischaemic stroke was the most common cause of focal seizure, which could be because of the high prevalence of tuberculosis in Assam and other northeastern states (24).

5. CONCLUSION

In this study, we found that stroke was the most common cause of new-onset seizure in elderly patients (haemorrhagic followed by ischemic), followed by metabolic causes, which is interesting because it emphasises the need to control associated comorbidities such as hypertension and diabetes, which can prevent stroke and seizure. Also, regular follow-up of such patients can prevent seizures due to metabolic disturbances such as hypo and hyperglycemia.

Thus, this study reflects that although the geriatric population deserves additional attention and care, they are being deprived of multiple factors that need to be explored. Perhaps, a holistic approach towards the elderly can prevent them from succumbing to the complications of non-communicable diseases.

6. REFERENCES

1. The History and Stigma of Epilepsy. Epilepsia. 2003;44(s6):12–4.
2. Amudhan S, Gururaj G, Satishchandra P. Epilepsy in India I: Epidemiology and public health. Annals of Indian Academy of Neurology. 2015 Oct 1;18:263–77.
3. Lowenstein DH. Seizures and Epilepsy. In: Jameson JL, Fauci AS, Kasper DL, Hauser SL, Longo DL, Loscalzo J, editors. Harrison's Principles of Internal Medicine [Internet]. 20th ed. New York, NY: McGraw-Hill Education; 2018 [cited 2022 Apr 5]. Available from: accessmedicine.mhmedical.com/content.aspx?aid=1187887265
4. Hernández-Ronquillo L, Adams S, Ballendine S, Téllez-Zenteno JF. Epilepsy in an elderly population: Classification, etiology and drug resistance. Epilepsy Research. 2018 Feb;140:90–4.
5. Werhahn KJ, Trinka E, Dobesberger J, Unterberger I, Baum P, Deckert-Schmitz M, et al. A randomized, double-blind comparison of antiepileptic drug treatment in the elderly with new-onset focal epilepsy. Epilepsia. 2015 Mar;56(3):450–9.
6. William J. Marks J, Garcia PA. Management of Seizures and Epilepsy. AFP. 1998 Apr 1;57(7):1589.
7. Huff JS, Murr N. Seizure. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2022 [cited 2022 Apr 5]. Available from: http://www.ncbi.nlm. nih.gov/books/NBK430765/
8. Scheffer IE, Berkovic S, Capovilla G, Connolly MB, French J, Guilhoto L, et al. ILAE classification of the epilepsies: Position paper of the ILAE Commission for Classification and Terminology. Epilepsia. 2017 Apr;58(4):512–21.
9. Elderly India 2021 [Internet]. [cited 2022 Apr 10]. Available from: https://www.mospi.gov.in/documents/213904/301563/Elderly%20in%20India%2020211627985144626.pdf/a4647f03-bca1-1ae2-6c0f-9fc459dad64c
10. Verma A, Kumar A. Clinical and etiological profile of epilepsy in elderly: a hospital-based study from rural India. Acta Neurol Belg. 2017 Mar;117(1):139–44.
11. Reddy GR, Vishvanayak. Clinico-Etiological Profile of New Onset Seizures in Gaeriatric Patients at a Tertiary Care Hospital: Academia Journal of Medicine. 2019;2(2):195–9.
12. Siddharth KM, Farishta F. CLINICAL AND ETIOLOGICAL PROFILE OF SEIZURES IN ADULTS. INDIAN JOURNAL OF APPLIED RESEARCH. 2017;5.
13. McHugh JC, Delanty N. Epidemiology and classification of epilepsy: gender comparisons. Int Rev Neurobiol. 2008;83:11–26.
14. Beghi E. The Epidemiology of Epilepsy. NED. 2020;54(2):185–91.
15. Annegers JF, Rocca WA, Hauser WA. Causes of Epilepsy: Contributions of the Rochester Epidemiology Project. Mayo Clinic Proceedings. 1996 Jun 1;71(6):570–5.
16. Banerjee D, Dhar M, Pathania M, Ravikant, Rathaur VK. Mortality pattern of elderly patients at a tertiary care hospital: A study from Sub-Himalayan region, Uttarakhand, India. J Family Med Prim Care. 2019 Feb;8(2):426–31.
17. Mahanta BN, Mahanta TG, Gogoi P. Clinico-epidemiological profile of stroke patients admitted in a tertiary care Hospital of Assam. Clinical Epidemiology and Global Health. 2018 Sep 1;6(3):122–9.
18. Hazarika NC, Biswas D, Narain K, Kalita HC, Mahanta J. Hypertension and its risk factors in tea garden workers of Assam. Natl Med J India. 2002 Apr;15(2):63–8.
19. Bladin CF, Alexandrov AV, Bellavance A, Bornstein N, Chambers B, Coté R, et al. Seizures after stroke: a prospective multicenter study. Arch Neurol. 2000 Nov;57(11):1617–22.
20. ETIOLOGICAL PROFILE OF NEW ONSET SEIZURES | Request PDF [Internet]. [cited 2022 Oct 9]. Available from: https://www.researchgate.net/publication/289243712_ETIOLOGICAL_PROFILE_OF_NEW_ONSET_SEIZURES
21. Kaur S, Garg R, Aggarwal S, Chawla SS, Pal R. Adult onset seizures: Clinical, etiological, and radiological profile. J Family Med Prim Care. 2018;7(1):191.
22. Sendil G, Kumar AN, Kumar MV. Late Onset Shake-Etiology At Stake - A Prospective Study: INTERNATIONAL JOURNAL OF SCIENTIFIC STUDY. 2014;2(1):20–4.
23. Amaravathi DKS, Nagamani DR, Sakuntala DP, Shyamsunder DMN, Rajasekhar DPV, Gopalakrishna V. A Study on Clinical Profile of New Onset Focal Seizures in a Tertiary Care Centre. 2015;5(7):4.
24. Bhattacharya P, Talukdar K, Barman B, Jamil M, Phukan P, Mobing H, et al. Clinical Spectrum and Medical Comorbidities in Tuberculosis: A Hospital-Based Study in Northeast India. Cureus [Internet]. 2020 Sep 21 [cited 2022 Apr 11];12(9). Available from: https://www.cureus.com/articles/41067-clinical-spectrum-and-medical-comorbidities-in-tuberculosis-a-hospital-based-study-in-northeast-india