

Study of Epileptic Seizures in the Elderly

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Abstract: The elderly are fastest growing heterogeneous segment of the population, owing to advanced civilization in developing country like India, constituting nearly 30% of the total population. Epilepsy is defined as the occurrence of at least two unprovoked seizures separated 24 hours apart or a single epileptic seizure in association with an enduring disturbance of the brain capable of giving rise to further seizures. Elderly have the highest prevalence and incidence of epilepsy. Type of presentation, precipitating factors and comorbidities are varied. The resulting treatment and psychosocial outcome are its own kind, henceforth recommend our attention. This study was carried on 100 elderly who presented with an epileptic seizure. Detailed clinical data was obtained; investigations were carried out and managed. Of 100 patients, with mean age of 72yrs, 70% were male, 30% female. Most common presentation was generalized tonic-clonic seizures, followed by simple partial, complex partial, focal with secondary generalization. Various aetiologies identified were cerebro-vascular events, followed by metabolic, acute infections, trauma-subdural hematoma and tumours. 10% had unidentified aetiology. All were started on first line antiepileptics with optimum control and no dose limiting adverse effects. Our subjects had comorbidities and contributing risk factors like hypertension, dyslipidaemia, diabetes mellitus, previous stroke, smoking, and alcoholism. As the population ages, statistics show that clinicians are likely to face more elderly with epilepsy both now and in the future. Epilepsy in the elderly is very different from younger adults, from aetiology and diagnosis, to treatment and psychosocial aspects. Hence, recognition of these important differences and understanding of special issues in the elderly improve our diagnostic approach.

Keywords: Elderly, epilepsy, seizure, etiology, treatment, tolerability.

INTRODUCTION

Elderly (aged above 60 years) is the heterogeneous group of population that is most rapidly growing as a result of progressive increase in life expectancy [1]. Advanced civilization promotes longevity of human being. According to Population Census 2011 there are nearly 104 million elderly persons (aged 60 years or above) in India, with 53 million females and 51 million males. A report released by the United Nations Population Fund and Help Age India suggests that the number of elderly persons is expected to grow to 173 million by 2026.

Epilepsy is the third most common neurological condition after dementia and stroke among the elderly [3]. The incidence of new onset seizures and epilepsy in the elderly is higher than any other age group [1] Twenty four percent of new onset seizures

happen after the age of 60 years [2]. One of the reason for this is increase in age-related co-morbidities such as stroke and dementia, which predispose to epilepsy, but in a small proportion the cause remains unidentified. If under diagnosis is taken into account, the incidence of epilepsy in older people may be 2-3 times higher than the number observed, and possibly 6-10 times greater than among younger people. In a recent study in U.S, the annual incidence of epilepsy in elderly was 2.4/1000 with a prevalence rate of 10.8/1000.

Epilepsy is defined as the occurrence of at least two unprovoked seizures separated 24 hours apart, but the latest consensus by International League against Epilepsy (ILAE-2014 Guidelines) requires only a single epileptic seizure in association with an enduring disturbance of the brain capable of giving rise to seizures [4]. Many of the etiological factors leading to a

first epileptic seizure in the elderly becomes a predisposition to further seizures [2].

The causes and clinical manifestations of seizures in elderly differ from younger population in several aspects and they may mimic other non-neurological conditions like hypoglycemia, syncope and hence are difficult to diagnose, and are precipitated by subtle events [4,5]. Age-related neurological conditions like cerebrovascular and neurodegenerative disorders are the most common etiological factors. Among the different types of dementia, patients with Alzheimer’s disease are up to 10 times more likely to develop epilepsy than those without; this increases as the dementia progresses [22].

Seizures in elderly are usually atypical, with less of classical aura, automatism, with prolonged post-ictal state, and are vulnerable to injuries and psychological stigma. Quality of life will be adversely affected. Diagnosing epilepsy in the elderly is challenging, as reliable history is often difficult to obtain and Electroencephalography (EEG) findings may be nonspecific.

Epilepsy in older people generally responds well to treatment. Around 60-70% will achieve good seizure control with a single anti epileptic drug (AED) and upto 80% can be expected to remain seizure free [19].

Treatment should be based on careful assessment of the patient’s hepatic and renal functions, other co-morbid conditions and side effects of the medications. However, choice of drugs in older people is more complex than it is in younger people, who are often in better health and less likely to be taking other medications (Ramsay et al, 2004). Risk/benefit profiles of various Antiepileptic Drugs (AEDs) should be compared carefully in this specific population [6].

Hence, there is a need for complete evaluation to ascertain the etiology for early control and initiation of treatment.

AIM

To study the clinical profile of new onset epileptic seizures in elderly population in a tertiary health care center.

MATERIALS AND METHODS

This is a simple cross sectional, analytical and hospital based study carried out on 100 elderly patients who were admitted under department of medicine, P.E.S Institute of Medical Sciences and Research (PESIMSR), Kuppam, with a history of an unprovoked epileptic seizure.

- Written and valid Informed Consent was obtained from patients’ attendants.
- An elaborate history of events regarding onset, frequency and etiological clues, comorbidities through medical records, and trauma including surgical ailments, drug and social history were recorded.
- A complete general and systemic examination with detailed neurological examination was carried out on all patients. In addition to the routine laboratory investigations, electrocardiography, chest radiograph, CT scan or MRI brain and Electro Encephalogram (EEG) wherever required was done.

RESULTS AND ANALYSIS

Of the 100 patients (average aged 72 ±10 years), 70 (70%) were male and 30 (30%) female. The maximum number of patients was in the age group 60–69 years (62%). All were identified as a case of definite epileptic seizure, few presenting at the time of their first seizure, others with recurrence (>2).

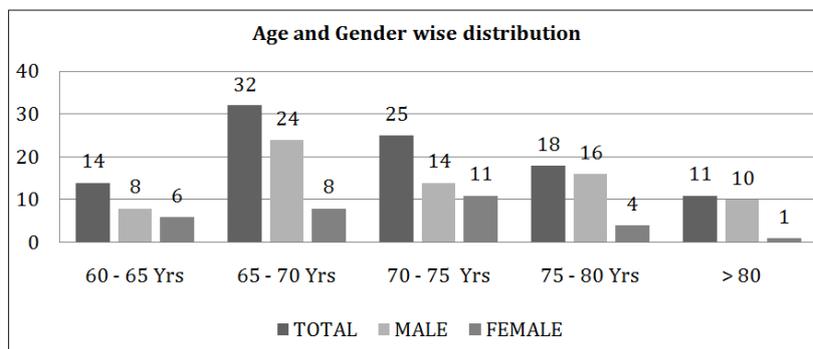


Fig-1: Gender wise distribution of cases

The etiology of epilepsy is attributed to myriad conditions. In our study they are mainly vascular, manifesting either as stroke or intra-cerebral bleed (IC bleed) in majority of cases (55%) (As found in multiple studies in developed as well as developing countries)

[6], followed by metabolic causes such as hyponatremia, hypoglycemia and uremia (15%). Infectious causes like meningitis and encephalitis was seen in 10%, trauma-subdural hematoma (3%), and tumors (3%). Neurodegenerative disease-dementia and

alcohol withdrawal constituted 2% each. 10% of the cases had unidentified etiology.

The most common associated risk factor was hypertension followed by raised total cholesterol, diabetes mellitus, previous stroke, smoking and alcohol (Fig-2).

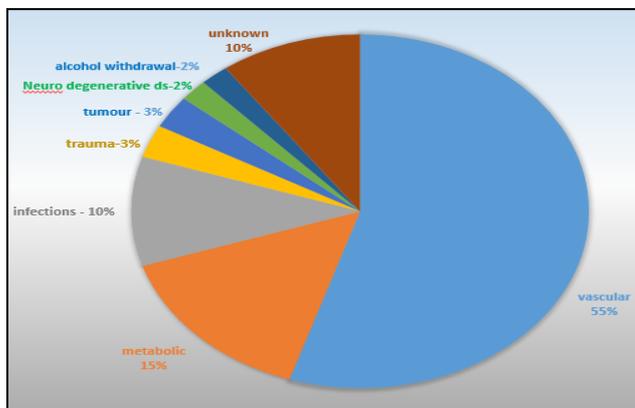


Fig-2: Etiologies of epilepsy

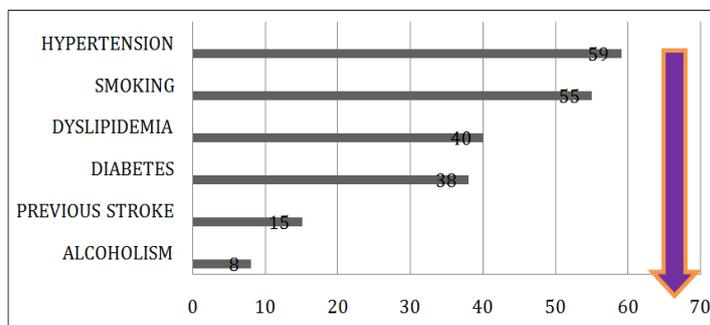


Fig-3: Risk factors

Definite seizures are classified according to ILAE guidelines [International league against epilepsy]. Generalized tonic-clonic seizures (GTCS) is the commonest type with 48%, followed by simple-partial seizures (SPS) 22%, complex-partial seizures

(CPS) 16% and simple partial or focal with secondary generalization 14%.

Patients with metabolic, infectious and majority of vascular causes presented with GTCS.

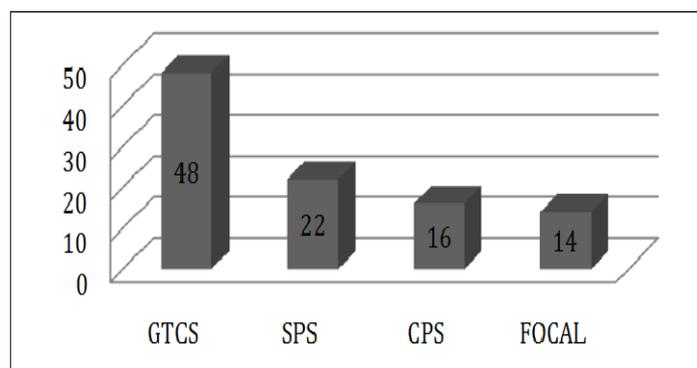


Fig-4: Types of seizures

CT scan, MRI brain revealed a normal study in 40 cases, while there was atrophic changes in (30), followed by lacunar infarcts (10), gliosis (9), ICbleed (5), tumor (3), and subdural hematoma (3). Majority of patients with GTCS had a normal imaging study while gliosis was the commonest finding among those presenting with CPS.

An EEG was done on 75 patients, while it could not be carried on 25 patients due to various unavoidable reasons. EEG was normal in 40 patients, while epileptiform discharges were found in 15, and 10 each had generalized slowing and focal slowing.

All patients were initiated on AEDs. Most of the patients were started on phenytoin (>75%) and carbamazepine with good seizure control. Optimum result was found with first line drugs with no dose limiting adverse effects. There was no mortality in our study.

DISCUSSION

In this study, we made an attempt to establish varied etiology of epilepsy among the elderly population in whom it is more common than generally believed. Male predominance (70) was observed, owing partly to the poor health seeking behavior among females (30).

Cerebro-vascular events (55%) constituted for the majority of causes, followed by metabolic and infectious etiologies, which correlates with the study by Bruscky IS (35-50%) [19]. Rare causes like TIA, ischemic encephalopathy were not found.

Few cases were left undiagnosed, but in view of recent advances, this number is likely to come down in future. About one-third of patients with early, and one-half of patients with late post-stroke seizures develop epilepsy [8,9]. Predictors of seizures with ischemic stroke include severity (initial and persistent), large size, embolic cause, and involvement of the cortex, hippocampus or multiple brain areas [10,11]. The relationship between stroke and seizures may be bidirectional in the elderly, as some studies have shown that the risk of stroke is increased by nearly three-fold in patients with late-onset seizures [12].

Metabolic and electrolyte disturbances precipitating acute seizures include hypoglycemia, hyperglycemia, uremia, hyponatremia, hypocalcemia, hypothyroidism, pneumonia, and urosepsis. In our study we found hyponatremia, hypoglycemia and uremia, amounting to 15% of cases.

Approximately 10%-20% of epilepsy in the elderly is due to dementia and neurodegenerative diseases associated with cognitive impairment. Alzheimer's disease is the best-studied condition, and has been found to be associated with 10-fold increased risk of epilepsy than other dementias [16]. Patients with Alzheimer's disease have a ten-fold higher risk of epilepsy and 10-22% of patients with Alzheimer's have seizures. ⁽¹³⁾It has been studied that interplay of beta-amyloid, tau, and the tyrosine kinase Fyn may result in network excitability in the hippocampus, and that reduction of tau may be helpful in preventing the development of spontaneous seizures [14].

Compared to younger patients, presentation and type of seizures in elderly is often less classic. It is observed in most studies that a focal seizure is common presentation in the elderly. GTCS was the most common type of seizure in our study with 48%, which

is comparable to a study by Luhdorf's (51%). GTCS in our study may have been the generalized progression of focal and ours' being a rural population study, may be due to poor by stander observation/ interpretation. Aura is less common in elderly, if present, tends to be non-specific such as dizziness [15].

Post ictal confusion may be prolonged lasting for hours to weeks, which might be mistaken for encephalopathy or dementia as observed in few studies. In our study it was seen in 63% who recovered within few hours. This clinical difference may be related to the anatomical origin of seizures which is most likely to be frontal lobe in elderly, mesial temporal in young [15]. CPS may present with atypical features like memory lapses, episodes of confusion, inattention, syncope [19]. In a study of 23 elderly patients from south India, Thomas *et al.* noted that a first seizure was frequent symptom among those attending neurology clinics [21].

There are unique issues related to this group of population with regards to diagnosis and management. The most common risk factor in our study was hypertension (60%), which is similar to a study by Veterans affairs co-operative study 2003 in which 64% were associated with epilepsy in elderly. The most common findings of the neuroimaging studies were diffuse brain atrophy combined with microangiopathy (53%), followed by isolated microangiopathy (30%) and microangiopathy combined with focal cerebral gliosis (17%).

Despite the lack of studies on electroencephalography performed during first seizures in elderly patients, there is evidence supporting the need for this examination as a fundamental part of diagnosis, and to predict prognosis with regard to seizure control [18]. EEG is normal in majority of patients (53%) in our study consistent with study from Rev Bras in 2016.

Epilepsy in elderly responds well to treatment. Ideal drug does not exist when it comes to elderly group, in view of physiological changes that occur with aging that may influence drug dosing, due to their complex pharmacokinetics, interactions, possible increased susceptibility to adverse effects. Monotherapy was the predominant treatment strategy followed in our study with phenytoin being the most prescribed. Recent studies show recurrence rate after a new onset seizure in the elderly could be greater than 90% if untreated and despite a lack of consensus regarding treatment period, many studies recommend continuation of AED for an indefinite period.

The infrequent use of newer group of AEDs is due to limited financial resources among the population studied. Allergic reactions, drug interactions, toxicity manifestations are few known side effects, which were not encountered in our study. Apart from phenytoin, other drugs generally considered are valproate,

lamotrigine, carbamazepine, topiramate as first line. Second line being gabapentin, leviteracetam.

CONCLUSION

As the population ages, statistics show that clinicians are likely to face more elderly patients with epilepsy both now and in the future. Cerebro-vascular events being most common underlying etiology seizure prophylaxis should be considered. Hence, recognition of important differences and understanding of special issues in the elderly improve our diagnostic approach. They are also frequently under or over diagnosed. Choice of particular AEDs for elderly patients with epilepsy is influenced by many factors, guided by the evidence from clinical studies with the lowest necessary dose.

Studies show that complete control is achievable in around 70% of patients with AEDs, hence the need to diagnose early to initiate treatment. High morbidity and mortality unrelated to seizures limit follow-up analysis in the elderly. Optimum management requires rapid investigation, accurate diagnosis, effective treatment, sympathetic dealing and assured support. Large studies with research on pathophysiology of aging brain, in particular relation to epilepsy, and its treatments are needed.

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