

# A Prospective Study to Determine the most Prevalent Seizure Type and the Age Group Involved in Epilepsy

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## ABSTRACT

**Introduction:** Epilepsy is a neurological phenomenon rather than a single disease entity. Its incidence varies between 0.3-0.5%. Incidence of acute symptomatic seizure is twice in men as compared to women. The present study was conducted to determine the most prevalent seizure type and the most common age group affected

**Material and methods:** In the present study 100 patients who were above 18 years of age and had new onset seizures were included. A thorough history and complete examination of patients were done. The age of presentation and type of seizure were noted. Various investigations were performed. SPSS software was used for analysis.

**Results:** Majority of the males belonged to 7<sup>th</sup> decade of life and females to 3<sup>rd</sup> decade of life. The male to female ratio was 1.85:1. Most common type of seizures in our study was generalised tonic clonic seizure.

**Conclusion:** seizure disorders show a bimodal distribution and males are more frequently involved than females.

**Keywords:** Bimodal, Seizure, Tonic Clonic

## INTRODUCTION

Epilepsy describes a condition in which a person has recurrent seizures due to chronic, underlying process. Epilepsy refers to a clinical phenomenon than a single disease entity. Using the definition of epilepsy as two or more unprovoked seizures, it has a incidence of 0.3 – 0.5% amongst different population group throughout the world and the prevalence of epilepsy has been found to be 5-10 persons every 1000.<sup>1</sup> The incidence of first ever seizure among the elderly is as high as among young children and mortality of untreated epilepsy among the elderly is significantly higher than others. The natural history and outcome of first ever seizure among the elderly has been the subject of many recent studies, but very little is known from developing countries. Hauser and Kurland have been reported a marked increase in the incidence of seizure as the population ages from 11.9 per 100000 in the 40-60 yr group to 82 per 100000 in those 60yr of age or older.<sup>2</sup> According to a Canadian journal, seizures in elderly is atleast as high as in first decade of life. With increasing in age secondary causes of seizures become more frequent and consequently seizures are more likely to be focal in onset. More recently studies have shown that seizures in elderly are cryptogenic in 11 to 55%, secondary to stroke in 22 to 39% and secondary to tumour in 2 to 22%.<sup>3</sup> Seizure is commonly encountered in aged people as

complication of various medical disorders as well as due to treatment of many medical conditions. In older people the incidence of acute symptomatic seizure in men is 130/100,000 which is twice that of in women which is around 60/100,000. Acute symptomatic seizures in elderly are mostly due to cerebrovascular insult. The second most common cause for seizure in elderly is metabolic disturbance and others are brain trauma, drug, alcohol abuse, CNS infection and toxic insults.<sup>4</sup> The aim of the present study was to determine the most common type of seizure disorder and to determine the common age of presentation of epilepsy.

## MATERIAL AND METHODS

The present prospective study was conducted in the Department of Medicine, KIMS Hospital, Hubli. The study enrolled 100 subjects who reported to the out patient department with new onset seizures. Ethical committee clearance was obtained from the Institute's ethical board. A written informed consent was obtained from all the patients in their vernacular language prior to the study. Patients aged more than 18 years of age and with history of new onset seizures were enrolled in this study. Any patients with episode of hyperventilation, choreoathetosis, psychogenic seizures or narcoepilepsy were not included in the study. Patients with any known seizure disorder were also excluded from the study. Patient and their associates were questioned about history, presenting signs of the seizure and complete clinical examination was performed. All the data was entered in a predesigned proforma. Various Blood investigations like haemoglobin level, total leukocyte count, differential leukocyte count, ESR were performed. Estimation of blood urea, serum creatinine, blood glucose levels, and serum electrolytes were also done. The study also included various special investigations like lumbar puncture, CT and MRI-brain, EEG in selected cases.

## STATISTICAL ANALYSIS

The data obtained was arranged in a tabulated version. Analysis of data was done by SPSS software. Percentage of total value was used to express the results.

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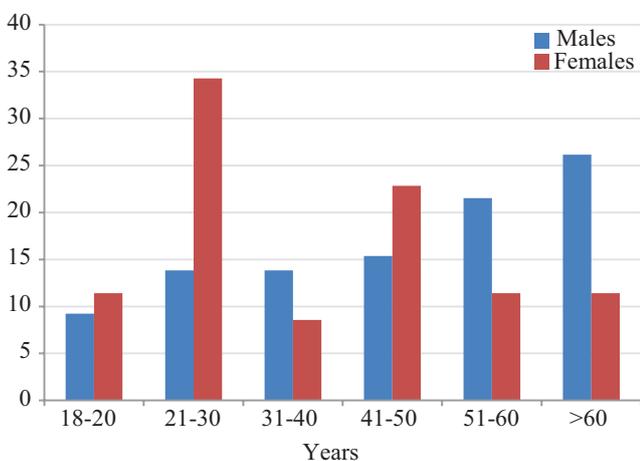
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Age in years	Male		Female		Combined	
	No	% among males	No	% among females	No	%
≤20	06	9.23	04	11.42	10	10
21-30	09	13.84	12	34.28	21	21
31-40	09	13.84	03	8.57	12	12
41-50	10	15.38	08	22.85	18	18
51-60	14	21.53	04	11.42	18	18
>60 years	17	26.15	04	11.42	21	21
Total	65	100	35	100	100	100
Mean +/-SD	45.76 +/- 16.44		39.72 +/- 17.24		43.59 +/- 16.9	

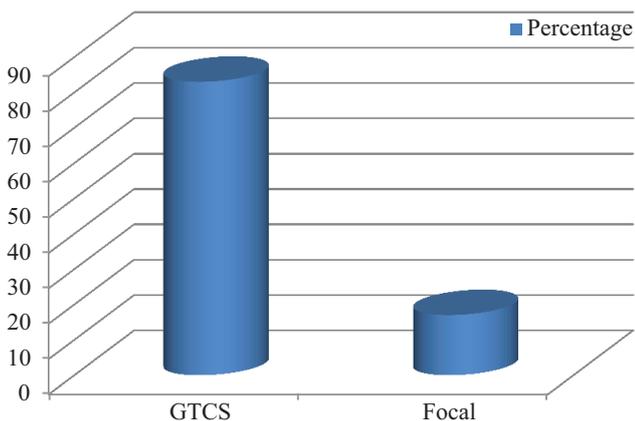
**Table-1: Age and sex distribution**

Type of seizure	Frequency	Percentage
Generalized tonic clonic seizure	83	83%
Focal seizure	17	17%
Total	100	100%

**Table-2: Prevalence of type of seizures**



**Figure-1: Age in years with comparison with sex**



**Figure-2: Prevalence of types of seizures**

**RESULTS**

In this present study patients were aged between 18-65 years of age. A total of 100 subjects were enrolled. Majority of patients were in the age group of 21-30 years (n=21, 21%) and >60 years (n = 21, 21%). This was followed by 41-50 years and 51-60 years. Out of 100 patients 65 were males and 35 were females, with male to female ratio of 1.85:1.00.

Majority of males were in 7<sup>th</sup> decade and females were in 3<sup>rd</sup> decade. There were 9.23% males (n=6) who were less than 20 years of age and 4 females who were less than 20 years of age. There were 13.84% males and 34.28% females who were 21-30 years of age. There were 9 males (13.84%) and 3 females (8.57%) of 31-40 years of age group. There were 26.15% males (n=17) and 11.42% (n=4) females who were more than 60 years of age. There were 14 males and 4 females who were 51-60 years of age. (Table-1, Figure-1) Table-2, Figure-2 shows the prevalence of type of seizures in the study group. There were 83% cases of generalised tonic clonic seizures and 17% cases of focal seizures. This show that majority of the patients suffered from generalised tonic clonic seizures.

**DISCUSSION**

Epilepsy is a major health problem especially in developing countries including India. WHO estimates that eight people per 1000 worldwide have this disease.<sup>5</sup> The single incidence study from southern India has documented a rate of 49.3 per 100,000 and global incidence varies from 11 to 190.<sup>6</sup> Another study conducted in West Bengal India said that the average annual incidence rate was 42.08 per 100,000 per year. This rate was higher than developed countries but lower than the developing countries.<sup>7</sup> In a study from United Kingdom by MacDonald et al, the life time prevalence of active epilepsy is 4 per 1000 population.<sup>8</sup> And study from Asia by Tu Luong Mac et al, the life time prevalence of epilepsy varied among countries from 1.5 to 14 per 1000 with the median life time prevalence is estimated at 6 per 1000 which is lower than in developing countries in other area of the world.<sup>4</sup> Etiological spectrum depends on age, sex, geography and medical setting.<sup>9</sup> In developed countries incidence of epilepsy follows a bimodal distribution with 1<sup>st</sup> peak in first few years whilst a second and more pronounced peak is in those >65 years. The age specific incidence and bimodal distribution reported in the developed countries have not been seen in developing countries. In India, incidence was higher among children age 0-14 (61/100,000) and sharply declined in the elderly age >60 years.<sup>10</sup> In a study from south India (Hyderabad) by Narayanan JT And Murthy JMK<sup>11</sup> (2007), 36% were > 60 years, with mean age of 49 years. In another study from West Bengal by Shankar P Saha et al, the typical late life increase in incidence rate was absent. The age specific incidence rate

was highest in the first decade of life.<sup>7</sup> In a study conducted in Dhaka, the median age for adult onset epilepsy is 20 years.<sup>12</sup> One study done in Shanghai, showed two prevalence peaks one between 10 and 30 years and one in people over 60 years old.<sup>13</sup> In the present study (Table-1), there is bimodal type of distribution. Majority of patients were in the age group of 21-30 years (n=21, 21%) and age >60 years (n=21, 21%). Out of 100 patients 65 were males and 35 were females, with male to female ratio of 1.85: 1.0 Majority of males were in age group >60 years and females were in 21-30 years. All studies were slightly male predominate. In the present study, There were 83% cases of generalised tonic clonic seizures and 17% cases of focal seizures. This show that majority of the patients suffered from generalised tonic clonic seizures. In a study conducted by Sander<sup>14</sup> et al, there were 39% cases of tonic clonic seizures and 52% cases of focal seizures. In another study by Narayanan JT and Murthy JMK<sup>11</sup>, 55% of the cases constituted of generalized tonic clonic seizures and 45% were of focal seizures. In a study conducted by Magda Lahorgue Nunes et al<sup>15</sup> to determine the incidence of epilepsy amongst children, they found that the incidence was 7/100,000 children, and the prevalence was 65.2/10,000 children. In another study conducted by Gursahani R et al<sup>16</sup> they concluded that detection of tonic clonic seizures requires proper history taking with EEG results. Only broad spectrum antiepileptic drugs should be initiated until focal seizures are confirmed. As per the study by K. S. Amaravathi et al<sup>17</sup>, the majority of the patients belonged to 28-37 years of age. The male to female ratio in their study was 1.5:1, which was similar to our study. According to Ravi Prakash Pandey et al<sup>18</sup> generalised tonic clonic seizures accounted for 51 cases, focal seizures were seen in 49 cases and status epilepticus was seen in 4 cases. Their study was conducted amongst geriatric population.

## CONCLUSION

From this study we can conclude that males are prone for acute symptomatic seizure. Majority of the seizures occurred in the patients of age group between 21-30 years and >60 years. Seizures have the tendency to show bimodal distribution. The most common seizure type observed in our study was GTCS type.

## REFERENCES

1. A.K. Badrinath, K. Suresh, R. Raghunathan, M. Balachandran, Suresh Babu S. A case of seizure disorder - pachygyria a rare presentation. *International Journal of Contemporary Medical Research* 2016;3:3243-3244.
2. Rooper HA, Brown HR, Epilepsy and seizure disorder. 8<sup>th</sup> edition section 4. In Adams and Victor's Neurology. New York: McGraw Hill companies; 2005 pp 291-3
3. A. Holt-Seitz, E.C. Wirrell, M.B. Sundaram Seizure in the elderly: etiology and prognosis *Canadian Journal of Neurological Sciences* 1999;26:110-114.
4. M.A.Aleem, D.Nagaraja. Seizure Disorders in Elderly. *Annals of Indian Academy of Neurology* 2005;8:25-31.
5. Tu Luong Mac, Duc-si Tran, Fabrice Quet, Peter Odermatt, Pierre Marie Preux, Chong Tin Tan.

Epidemiology, aetiology, and clinical management of epilepsy in Asia: a systematic review. *Lancet Neurol* 2007;6:533-43.

6. Mani KS, Rangan G, srinivas HV, Kalyanasundaram S, Narendran S Reddy AK. The yelandyr study: a community based approach to epilepsy in rural south India epidemiological aspects. *Seizure* 1998;7:281-8.
7. Shankar P saha, Sushanta Bhattacharya, Biman Kanti Roy. A prospective incidence study of epilepsy in a rural community of West Bengal, India. *Neurology Asia* 2008;13:41-48.
8. B.K. MacDonald, O.C. Cockerell, J.W.A.S. Sander and S.D. Shorvon. The incidence and lifetime prevalence of neurological disorders in a prospective community-based study in the UK. *Brain* 2000;123:665-676.
9. Heidi LR, Frank WD. Seizures. *Neurol Clin* 1998; 16:257-284.
10. Shih-Hui Lim. Epidemiology and etiology of seizures and epilepsy in the elderly in Asia. *Neurology Asia* 2004;9:31-32.
11. Jaishree T narayanan, J.M.K Murthy. New onset acute symptomatic seizure in a neurological intensive care unit: *Neurology India* 2007;55:issue 2.
12. Sardar MH. Howlader Mar, Mallik MU, Appolo AM, Islam MS, Azad KAK. Patterns of adult onset epilepsy attended in an epilepsy clinic in a specialised hospital: A prospective cross sectional study. *J Dhaka Med Coll.* 2011;20:20-24.
13. Huang M Hong Z, Zeng J et al. The prevalence of epilepsy in rural Jinshan in Shanghai. *Zhonghua Liu Zing Bing Xue Za Zhi* 2002;23:345-46.
14. Sander JWAS, HartYM, Johnson AL,Shorvon SD. NationalGeneralPractice Study of Epilepsy: newly diagnosed epileptic seizuresina general population. *Lancet* 1990;336:1267-1271.
15. Nunes ML, Geib LT. Incidence of epilepsy and seizure disorders in childhood and association with social determinants: a birth cohort study. *Jornal de pediatria.* 2011;87:50-6.
16. Gursahani R, Gupta N. The adolescent or adult with generalized tonic-clonic seizures. *Annals of Indian Academy of Neurology.* 2012;15:81.
17. Amaravathi KS, Nagamani R, Sakuntala P, Shyamsunder MN, Rajasekhar PV, Gopalakrishna V. A Study on Clinical Profile of New Onset Focal Seizures in a Tertiary Care Centre. *International Journal of Scientific and Research Publications.* 2015 Jul
18. Ravi Prakash Pandey, Anurag Chaurasia, Sunil Ahuja, Panchalingppa Betageri, Manoj Indurka. A Study of Clinical Profile of Seizure Disorder in Geriatric Population, *Sch. J. App. Med. Sci.*, 2017;5:237-243.

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