

Pattern and Etiology of Different Types of Seizures in GMC Srinagar - An Observational Prospective Study from Kashmir

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How to citation this article: Shubana Ashraf, Maqsood Ahmad Dar, Owvass Hamid Dar, “Pattern and Etiology of Different Types of Seizures in GMC Srinagar - An Observational Prospective Study from Kashmir”, IJMACR- January - 2025, Volume – 8, Issue - 1, P. No. 151 – 157.

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Type of Publication: Original Research Article

Conflicts of Interest: Nil

Abstract

Introduction: Around 70 million people are living with epilepsy worldwide with an estimated 12 million in India (1/6th of global burden). The treatment and outcome of epilepsy patients is highly influenced by the type of seizure as some of the antiepileptic drugs may precipitate certain types of seizures. In low resource countries like India a significant treatment gap has been reported to exist in epilepsy in view of poor classification of the disease and not looking up for the etiological factors. By classifying epilepsy as per International League Against Epilepsy (ILAE) 2017 at the index visit of the patient to the hospital we conducted study to know the treatment gaps that exist in our hospital which would help in the

proper and specific management of the majority of the patients suffering from epilepsy.

Aims and objectives: To find the relative frequency of different types of seizures and to determine the presumed etiology of the epilepsies presenting to our hospital

Study design: Study was conducted in the department of neurology and department of medicine in GMC Srinagar over the period of 8 months. All the patients with epilepsy or epilepsy syndromes as defined by ILAE 2017 were included in the study. Patients having syncope, behavioral and sleep disorders, tics, psychogenic paroxysmal disorders, periodic limb movement syndrome, acute symptomatic seizure were excluded. The data was collected with respect to

demographic profile, age of onset, history of febrile seizures or other antecedents past history of stroke, meningitis, encephalitis, trauma), family history of epilepsy and detailed history of seizure semiology. Metabolic workup was done to rule out any structural or lesional cause of epilepsy. EEG was performed for 30 minutes to look for any focal or generalized discharge.

Results: A total of 160 patients were included in the study out of which 45.6% were females. Of the studied population about 57 patients (35.63%) had focal motor, 35(21.88%) had focal non-motor, 55(34.38%) had generalized motor, 10(6.25%) had generalized non-motor epilepsies. Major MRI brain abnormalities were seen in the form of granulomas 10%, post stroke sequelae 10%, Mesial temporal lobe sclerosis (MTS) 7.5% and etc. EEG abnormalities were seen in 14.5% in individuals with idiopathic generalized epilepsies and 7.5% of focal epilepsies. The overall yield of EEG in detecting epileptiform discharges in our study was 22%.

Conclusion: By applying ILAE 2017 classification at the outset and by trying to find out etiological factors responsible for the epilepsy, a proper management of the epilepsy can be done in good number of cases.

Keywords: Seizures, epilepsy, HIE, MTS, metabolic, etiology

Background: Around 70 million people are living with epilepsy worldwide with an estimated 12 million in India (1/6th of global burden).^{1,2} The prevalence of epilepsy differs significantly among countries depending upon the local distribution of risk and etiological factors. In low resource countries like India a significant treatment gap has been reported to exist in epilepsy in view of poor classification of the disease and not looking up for the etiological factors³. By classifying epilepsy as per International league Against Epilepsy (ILAE) 20017 at

the index visit of the patient to the hospital, we would get to know the treatment gaps that exist in our hospital which would help in the proper management of the majority of the patients suffering from epilepsy.

Aims and objectives

1. To find the relative frequency of different types of seizures presenting to our superspeciality hospital of GMC Srinagar as per ILAE 2017.
2. To find the presumed etiology of the epilepsies presenting to our hospital.

Design and method

Study was conducted in the department of neurology and department of medicine in GMC Srinagar and the data was collected over the period of 8 months fulfilling inclusion and exclusion criteria. Inclusion criteria included the patients with epilepsy or epilepsy syndromes as defined by ILAE 2017. ⁴Patients having syncope, behavioral and sleep disorders, tics, psychogenic paroxysmal disorders, periodic limb movement syndrome, acute symptomatic seizure were excluded.

The data was collected with respect to demographic profile, age of onset, history of febrile seizures or other antecedents past history of stroke, meningitis, encephalitis, trauma), family history of epilepsy and detailed history of seizure semiology. Metabolic workup was done to rule out any structural or lesional cause of epilepsy (Table 1). EEG was performed for 30 min to look for any focal or generalized discharge. History of drug intake was also noted with special emphasis on the dosage and the type of medication.

Table1: Distribution of various Characteristics among study participants

Characteristic	Status	Frequency	Percent
Past History of encephalitis / meningitis	Yes	2	1.30
	No	158	98.80
Refractory Epilepsy	Yes	2	1.30
	No	158	98.8
Presenting as Status Epilepticus	Yes	8	5.00
	No	152	95
Family History of Epilepsy	Yes	6	3.75
	No	154	96.25
Past History of Stroke	Yes	16	10
	No	144	90
History of Head Injury	Yes	4	2.50
	No	154	97.50

Ethical clearance was taken from the institutional ethical committee of Government Medical College Srinagar.

Statistical analysis: Data was entered in excel sheet and analyzed through SPSS 22. Data was expressed in frequencies and percentages. Chi square test was used to assess relationship between two categorical variables.

Results: A total of 160 patients were included in the study out of which 45.6% were females. Of the studied population about 92 (57.50%) patients had focal seizures, 65(40.63%) had generalized seizures and 3(1.88%) had unknown onset seizures (Table 2). The distribution of seizures as per ILAE 2017 is shown in Table 3. About 57 patients (35.63%) had focal motor, 35(21.88%) had focal non-motor, 55(34.38%) had generalized motor, 10(6.25%) had generalized non-motor epilepsies. Figure 1 shows distribution of epilepsy patients with respect to age group.

Table 2: Distribution of seizure types among study population

Type of seizure	Frequency	Percent
Focal	92	57.50
Generalized	65	40.63
Unknown	3	1.88
Total	160	100.00

Table 3: Different subtypes of seizures in studied population

Type of seizure	Frequency	Percent
Focal motor	57	35.63
Focal non motor	35	21.88
Generalized motor	55	34.38
Generalized non motor	10	6.25
Unknown motor	3	1.88
Total	160	100.00

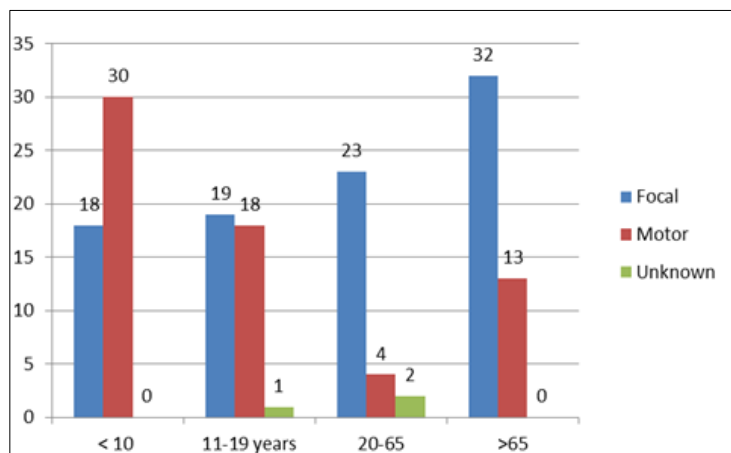


Figure 1: Distribution of seizures as per age group

MRI brain was normal in 86 (53.75%) patients. MRI brain abnormalities were seen in the form of granulomas 10%, post stroke sequelae 10%, Mesial temporal lobe sclerosis (MTS) 7.5%, Intracranial space occupying lesion (ICSOL) 4.4%, encephalomalacia 2.5%, Hypoxic ischemic encephalopathy (HIE) 2.5%, Focal cortical dysplasia (FCD) 1.9%, autoimmune encephalitis 1.9%, cortical atrophy 1.9%, periventricular heterotopia 1.3%, leucodystrophy 1.3%, non-infectious granuloma 0.6%, post-infectious scarring 0.6% (Table 4)

Table 4: Various MRI findings of patients with epilepsies

Mri Findings	Frequency	Percentage
Normal findings	86	53.75
Granuloma	16	10.00
Post stroke sequelae	16	10.00
MTS	12	7.5
ICSOL	17	4.4
Encephalomalacia	04	2.5
HIE	04	2.5
FCD	03	1.9
Autoimmune focal encephalitis	03	1.9
Cortical atrophy	03	1.9
Periventricular heterotopias	02	1.3
Leukodystrophy	02	1.3
Noninfectious granuloma	01	0.6
Post infectious scarring	01	0.6
Total	160	100.00

Abnormal EEG findings were seen in 14.5 % cases of generalized epilepsy and 7.5 % cases of focal epilepsy patients (Table 5)

Table 5: EEG findings in patients of study population

EEG Findings	Frequency	Percent
Normal findings	124	77.5
Anterior temporal spikes	4	2.5
Temporal slowing	2	1.25
Frontal slowing and spike wave discharges	2	1.25
Occipital Spikes	4	2.5
Generalized spikes & wave discharge	12	7.5
Poly Spike and wave	2	1.25
3 Htz spike and wave	6	3.75
3 to 4 Hrz spike and wave	4	2.5
Total	160	100

Discussion

Management of epilepsy and the use of anti-seizure medications are highly influenced by the proper diagnosis of the seizure type and epilepsy syndrome in order to have the best outcome in terms of seizure control and morbidity and mortality. Our study suggested that if patients were classified at the outset with an appropriate history as per ILAE 2017 classification and with the minimal investigations (MRI, EEG) a thorough clinical diagnosis of the type of the epilepsy whether focal or generalized, or epilepsy syndrome can be made, and accordingly patient can be managed with the appropriate medical/surgical treatment. Our study did not appreciate any overall gender difference among epilepsies, though subgroup analysis showed that the focal epilepsy due to lesional causes(traumatic, post-stroke, granuloma) was mostly seen in males and temporal lobe sclerosis related epilepsies and idiopathic epilepsies especially in young were more often seen in females. Gender based earlier studies have shown epilepsies are more common in males than in females^{5,6}. Highest frequency of epilepsies was seen in less than 10 years of age group (30%)

followed by more than 65 years age group (28%) while as 24% in 10-19 years of age. In studies by Hauser et al⁷ 1993, highest incidence of epilepsy was seen in childhood and over 75 years of age figuring a U-shaped curve. In developing countries children and young adults have highest incidence of epilepsy as against the elderly (medina et al 2005)⁸.The predominant seizure type in patients less than 10 years of age was idiopathic generalized epilepsy, while it was focal epilepsies in the rest of the age groups. Among the focal epilepsies lesional epilepsies constituted 46.25% among which granulomas and post stroke etiologies constituted about 10% each, while other lesional etiological causes included MTS, ICSOL, HIE, FCD, Encephalomalacia, Autoimmune encephalitis, Cortical atrophy, Periventricular heterotopia, leukodystrophy, non infectious granuloma and post infectious scarring. This finding was in agreement with the other studies that showed focal seizures were the predominant type of seizures in children and adults.^{9,10} In a population-based study done 20 years ago in a US population¹¹, focal seizures of unknown etiology were the most common group in people newly diagnosed with epilepsy (17.5

cases per 100,000 per year), followed by symptomatic partial epilepsies (focal epilepsies of structural or metabolic etiology according to the new ILAE classification; 17.20)⁴, unknown epilepsies (epilepsies of unknown etiology; 9.7), symptomatic/cryptogenic epilepsies (epilepsies of structural or metabolic etiology/unknown etiology; 4.0), idiopathic generalized epilepsies (3.7), and idiopathic partial epilepsies (i.e., generalized and focal epilepsies of presumed genetic origin; 0.2). In a study in rural china¹² regarding the MRI brain abnormalities, 597 individuals (58% male, median age 38 years) with MRI scans were analyzed, 488 (82%) had active epilepsy. The MRI was abnormal in 389 individuals (65%), with potentially epileptogenic lesion in 224 (38%) and nonspecific abnormalities in 165 (28%), and 108 (18%) were potentially resectable. The potentially epileptogenic lesions were less frequently detected in children (<18 years old, 12 of 68, 18%) than in adults (212 of 529, 40%; $p < 0.001$). In our study, among the focal epilepsies, lesional epilepsies constituted 46.25% among which granulomas and post stroke etiologies constituted about 10% each, while other lesional etiological causes included: MTS, ICSOL, HIE, FCD, Encephalomalacia, Autoimmune encephalitis, cortical atrophy, periventricular heterotopia, leukodystrophy, non infectious granuloma, post infectious scarring. EEG abnormalities were seen in 14.5% in individuals with idiopathic generalized epilepsies and 7.5% of focal epilepsies. The overall yield of EEG in detecting epileptiform discharges in our study was 22%. In our study the yield of obtaining epileptiform discharges were low as we did not do EEG within 24 hours in all the patients as the yield of EEG decreases proportionately with increase in the latency of doing the EEG after seizures. In a study conducted by

A. Llauradó et al the time interval associated with the highest probability of detecting an epileptiform EEG pattern was within the first 16 h after seizure onset: 52.1% of recordings performed before the 16-h cut-off showed these abnormal patterns compared with 20.2% performed after ($p < 0.001$)¹³

Conclusion

By applying ILAE 2017 classification at the outset and by trying to find out etiological factors responsible for the epilepsy, a proper management of the epilepsy can be done in good number of cases.

Acknowledgement

The authors are highly thankful to the patients, department of medicine, department of neurology and other departments in conducting the study

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