

CLINICO-AETIOLOGICAL SPECTRUM OF SEIZURE IN TERTIARY CARE HOSPITAL IN EASTERN UTTAR PRADESH

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ABSTRACT

BACKGROUND

There is limited data regarding aetiology of acute seizure episodes from the developing countries. Current study aims to study clinical spectrum of seizure in hospitalised patients in Nehru Hospital, BRD Medical College, Gorakhpur, Eastern Uttar Pradesh and to study risk factors and cause of seizure.

METHODOLOGY

This was a hospital-based, prospective observational study carried out in the Department of Medicine, BRD Medical College, Gorakhpur, from January 2015 to December 2015. All cases aged more than 16 years admitted to medical wards with seizures were included for the study except those patients with history of pseudoseizure and patients with insufficient clinical data for seizure diagnosis. Variables observed were demographics, clinical presentations, laboratory tests, electroencephalography brain imaging studies, clinical spectrum and hospital course.

RESULTS

A total of 200 patients were admitted for seizures with 123 (61.5%) males and 77 (38.5%) females; 55% presented with fever and most of patients (32%) were <26 years of age. Generalised tonic-clonic seizures were the most common seizure type (78%), CNS infections 43.5% and CVA 20% were common aetiologies. In Eastern U.P. among neuroinfections, Acute Encephalitic Syndrome (AES) was most common cause of seizure unlike other areas. NCC infection was contributing 21% cases of AES. While during course of study, 6 cases of JE were reported. Abnormal brain images were found in 116 (58%) patients. Most common abnormality in CT was Granuloma (10.5%). CT changes was more common in focal as compared to generalised seizures (P 0.001). In CNS infections, NCC was most common cause of focal seizure. CVA was found to be the most common aetiology in patients with above 40 years of age.

CONCLUSION

Aetiology may vary from region to region, but CNS infections and CVA are common causes of seizures in adults. In young population, AES is the most common cause of seizure in Eastern UP. Neuroimaging, cerebrospinal fluid examination and electrolyte examination apart from detailed history and neurological examination is essential for definitive diagnosis of seizure.

KEYWORDS

Neurocysticercosis NCC, Acute Encephalitic Syndrome AES, Electroencephalography (EEG).

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INTRODUCTION

The seizure was attributed to the god of the moon and many supernatural powers. After a long circuit through ages of magic, black humours and black disinterest, medical thought has returned to the affirmation that epilepsy like many other diseases is the root in natural causes.

Seizure is one of the most common neurological disorder and about 10% population experience in their lifetime.¹ Seizures as the first presenting event can be the feature of acute medical or neurological disorder.

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Seizure is a paroxysmal event due to abnormal excessive or synchronous neuronal activity in the brain. Determining the type of seizure that has occurred is essential for focusing the diagnostic approach on particular aetiologies, selecting the appropriate therapy and providing potentially vital information regarding prognosis. The prevalence and incidence of seizure is lower in developed countries in comparison with developing countries. Understanding pattern and risk factors of seizure cases will help in suggesting appropriate preventive measures.

A recent meta-analysis of published and unpublished studies puts the overall prevalence rate of seizure in India at 5.59 per 1,000 population² with no statistically different rates between men and women or urban and rural residence population. WHO estimates that eight people per 1000 worldwide have this disease.³

Classification of seizures is more than an academic exercise, as it determines subsequent decisions on evaluation and treatment.

The aetiology of seizures is different in India and other developing countries as compared to the developed world.

Tuberculoma and neurocysticercosis have relatively high frequency in India.⁴

A systematic approach to confirming the diagnosis, establishing aetiology and determining likelihood of recurrence will aid the clinician in provision of optimal care. Modern techniques like Computed Tomography, Magnetic Resonance Imaging (MRI) and Positron Emission Tomography (PET) and SPECT are planned for intractable epilepsy for definitive localisation of epileptic focus. These advanced investigations are very important in patient with intractable epilepsy for presurgical evaluation.

The basic principles of good epilepsy care however will not change: strive for the best seizure control, maintain vigilance for side effects and continue to educate and advocate for the person with problems.

It is very surprising that till date very limited data available on clinical spectrum of seizure in Eastern Uttar Pradesh. In a design to analyse aetiology, it is desirable to select incident cases instead of prevalent cases. There are hardly any major prospective study on clinico-aetiological spectrum of seizure in India, which makes our study special as it is probable first study to evaluate aetiology and clinical profile of adult onset seizures in Eastern Uttar Pradesh.

MATERIALS AND METHODS

All patients with seizure included in study were in-patient of Nehru Hospital, BRD Medical College, Gorakhpur, UP. About 200 patients were taken and duration of study was 1 year, i.e. January 2015 to December 2015.

All patients were diagnosed and classified using the classification proposed by the International League Against Epilepsy.

Inclusion Criteria

- Age >16 presenting with seizure.

Exclusion Criteria

- Pseudoseizure.
- Syncopal attacks.

The investigations like blood sugar, electrolytes including calcium, blood urea, serum creatinine, Liver Function Test (LFT), complete haemogram including ESR were done on all the patients.

Specific investigations wherever indicated viz. CT scan/MRI brain - plain and contrast, Electroencephalography (EEG), Cerebrospinal Fluid (CSF) analysis, IgM ELISA for Japanese Encephalitis virus and enterovirus in serum and CSF IgM and NS1 antigen for dengue virus, electrocardiograph (ECG), X-ray-Chest.

The aetiology of seizures was determined on the basis of medical history, neurologic examination, various investigations, the EEG recording and CT scan/MRI brain.

RESULTS

In this studied population 200 patients were taken, out of which 77 patients were female. Mean age of patients is 40.7. Mean age of female patients is 37.3 with SD 17.7, while mean age of male patients 42.8 with SD 19.1. Male:female ratio is 1.56.

Five clinical findings were commonly found in patients. The most common presenting symptoms were altered

sensorium (80%) and fever (55%), which was present followed by headache (50%), vomiting (43%) and focal deficit including hemiparesis (21%).

Aetiology	Age 17-25	Age 26-40	Age 41-60	Age >60	Total
1. Vascular Events 40					
a) CVA (Ischaemic/Haemorrhagic)	-	5	19	11	35
b) SDH					1
c) CVT	1				1
d) SAH				2	2
E)AVM			1		1
2. Neuroinfections 87					
A. AES	13	8	13	8	42
B. NCC	12	3	6	-	21
C. TBM	8	4	1	2	15
D. Malaria	4	1	1		6
E. HIV			2		2
F. ADEM (Post Infectious)	1				1
3. Metabolic 24					
A. Uraemia	3				3
B. Hypocalcaemia			1		1
C. Hepatic Encephalopathy		1			1
D. Hypoglycaemia			1	1	2
E. Hyperglycaemia		1	1		2
F. Hyponatraemia	2	8	3	2	15
4. Neoplastic 4					
5. Drug Default	6	4	3	2	15
6. Toxins					6
7. Others					3
8. Cryptogenic	11	4	5	1	21
Total					200

Table 1: Various Aetiology in Different Age Groups

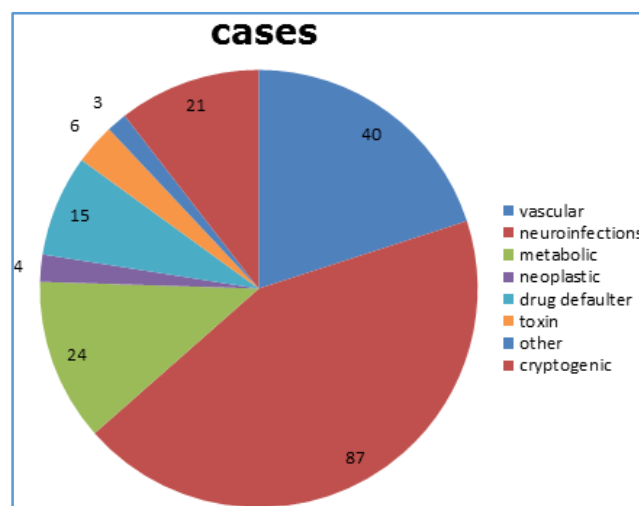


Fig. 1

Semiology	Infections	Vascular	Metabolic	Neoplastic	Toxins	Defaulters	Cryptogenic	Others
GTCS	68	28	21	1	5	13	17	3
Simple	2							
Complex	3	2	1					
2 ⁰ Generalised	11	8	1	3	1	1	1	
Status Epilepticus	3	2	1			1	3	

Table 2: Semiology in Relation to Cause

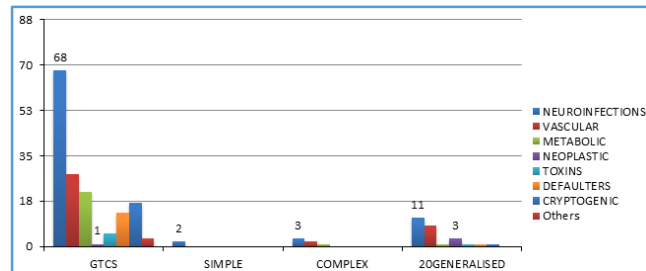


Fig. 2

Neuroimaging (CT/MRI scan) was found to be normal in 116 (58%) patients seizures. Most common abnormality observed was granuloma in 21 patients followed by infarct in 20, haemorrhage in 15, hydrocephalus in 6, Tuberculoma in 2 and Tumours in 4 patients. In 27 patients of focal seizure, CT was abnormal while in 53 patients of GTCS CT head was normal.

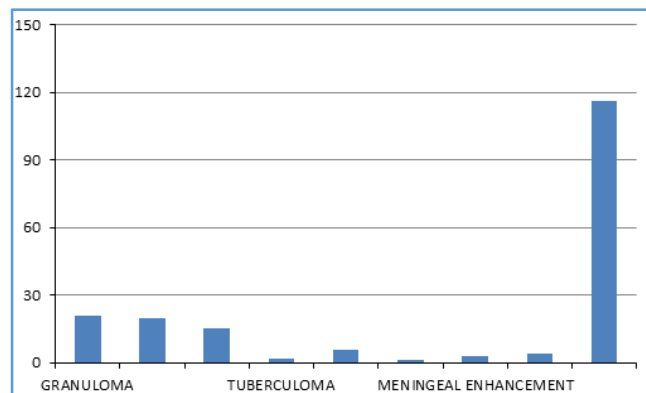


Fig. 3

In 8 patients of AES out of 42 three patients had mild meningeal enhancement and 3 had calcified granuloma, 1 had hydrocephalus, 1 had subcortical oedema, rest 34 patients of AES having normal CT. Normal CT head was found in 80.9% patients. In AES patient, most common CT findings was mild meningeal enhancement and calcified granuloma.

Aetiology	Male	Female
JE	4	2
HSV	0	2
TBM	1	2
Unknown	20	6
Dengue	0	1
Malaria	1	1
Typhoid	1	1
Total	27	15

Table 3: AES Patients with Various Aetiology

DISCUSSION

There are very few major hospital-based studies, which evaluated seizures prospectively in adults especially from developing countries.

Aetiological spectrum depends on age, sex, geography and medical setting. In our study, out of 200 patients most (32%) of patients were in the age group of (17-25) years and (16.5%) were in the age group of >60 years and which correlated with study done by Sridharan R, Murthy BN,² Thomas SV and Sarma PS.⁵

In younger age group (17-25 yrs.), most common cause of seizure was neuroinfections. Among neuroinfections, AES was the commonest cause followed by Neurocysticercosis (NCC). AES (Acute Encephalitic Syndrome) which was most common aetiology of seizure 21% (42 out of 200), these include patients of Japanese Encephalitis (JE), HSV encephalitis, viral encephalitis due to unknown aetiology, some cases of malaria and TBM and encephalitis due to dengue and typhoid.

As this North-East UP region is a belt more prone for encephalitis, so AES was most common neuroinfection. While study done by Sriharsha K and Malali,⁶ Narayanan J.T., Rao B.S., Vani M.S., Varma⁷ and Murthy⁸ reveal NCC (Neurocysticercosis) as most common neuroinfection.

Most common type of seizure admitted in Medicine Department were generalised type (156) (78%) followed by 17% as focal seizure, while 5% patients admitted to emergency as a case of status epilepticus. Similar observations were found in other studies.^{2,9,10}

The reason for higher percentage of generalised seizure disorder seems to be the patient's selection criteria, i.e. only hospitalised patients were taken into the study. Patients with focal seizure usually consult OPD treatment and require less admission as they are clinically stable.

NCC was the most common cause of focal seizure followed by CVA and neoplastic causes as in study of Sahil Mehta, Gagandeep Singh¹¹ and study of Pritpal.¹²

Among all causes of seizure in studied population, neuroinfections were most common cause followed by cerebrovascular accidents and metabolic causes. Similar observation was made in studies by JNK Murthy; Jaishree T, Narayan,⁸ Rao B.S., Vani M.S. and Varma,⁷ while vascular causes were more frequent cause in study of developed nations.^{13,14,15,16}

Among 40 patients with cerebrovascular accidents accounts for 20% of all causes, stroke accounted for 35 (Infarct - 20, Haemorrhage - 15) followed by SAH in 2 patients, 1 each AV malformation and cerebral venous thrombosis (CVT). These observations were similar to other Indian studies.^{2,7,8}

Neuroimaging was performed in all patients in our study. CT head was found normal in 116 patients, while abnormal in 84 patients.

Abnormal CT head was found in (76.47%) patients with focal seizure (32.25%) with generalised seizure. CT changes were more common in focal as compared to generalised seizures (P 0.0001). Baheti et al¹⁷ who also found CT scan abnormalities in 50% of patients with partial seizures and 34.6% patients with generalised seizures.

In our study most common CT finding in patients, NCC was Single Enhancing Lesion (SCEL) 57%, while multiple enhancing lesion (4.76%) and rest having calcified granuloma. Single lesion was the most common finding study by Singhi et al¹⁸ and Kotokey et al¹⁹ reported single lesion in 66.66%, Rajshekhar et al⁴ reported single lesion in 60.88%; Sahil Mehta and Gagandeep Singh¹¹ reported single lesion in 86%. Granuloma was also the most common neuroimaging finding in study done by Kaffle.²⁰

This study illustrates that the aetiological spectrum of acute seizure(s) were different from that described in developed countries and CNS infections still account for a significant number of cases.

Most of the patients in the present study belongs to rural areas with endemicity of diseases like AES, Neurocysticercosis and Tuberculosis. Low socioeconomic status and poor personal hygiene contribute to higher percentage of infectious aetiology of seizure in present study and other studies from developing countries.

Most of the patients living in these areas are infected at younger age and become symptomatic with seizure at a younger age. Risk factors for stroke increases with age and contribute to higher chances of stroke in elderly. Management of seizure is always multi-modal, which constitutes treatment of cause, avoidance of precipitating factors, suppression of recurrent seizures by prophylactic therapy and addressing a variety of psychological and social issues.

CONCLUSION

This study showed neuroinfections were the most common cause of seizure in Eastern Uttar Pradesh region and AES was the most common neuroinfection. JE was common among AES cases. NCC was the most common cause of focal seizure. Vascular aetiology was common above age 40. Most common type of seizure semiology in study was generalised pattern. CT abnormalities were documented more in patients having focal seizure. Although neuroimaging and other investigations were important to establish the cause, but medical history and neurological examination are equally important for best management. As this Eastern Uttar Pradesh belt is more prone to different viral encephalitis, patient with seizure should be screened for AES with variable aetiology. Treatment should be planned based on aetiological factor for seizure for better outcome.

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