

A Clinico Etiological Profile of Seizures in Adults Attending Pravara Rural Hospital, Loni

Dr. Abhijeet Gadhav¹, Dr. S. N. Mahajan², Dr. Jaya Bhardwaj³

^{1,2,3}Department of Medicine, Pravara Rural Medical College, Loni (Deemed to be University), Ahmednagar, Maharashtra, India

Abstract: ***Background:** Seizures disorders are common worldwide and are seen more frequently during medical practice. CNS infections like bacterial meningitis, viral encephalitis, tubercular meningitis, HIV, neurocysticercosis account for number of cases in developing countries. Etiology of seizures may vary from region to region. Etiologies of acute symptomatic seizures in developing countries are different from developed countries. Hence, this study was done to find out clinico etiological profile of seizures in adults in Pravara Rural Hospital. Objectives: To study the clinico etiological profile of seizure disorders. Methods: 81 cases were acute symptomatic seizures. This Descriptive study was done at Pravara rural hospital, Loni, Ahmednagar. This study was done to find out various etiologies of seizures in patients presented with acute onset seizures. In this study, history, clinical examination and radiological investigations like CT/MRI Brain, EEG, CSF analysis and other laboratory investigations were done to find out different etiologies of seizures. Results: Out of 81 patients, 45 were males and 36 were females. There was male preponderance with male to female ratio of 1.25: 1. Majority of males were in 5th decade and females were in 4th decade. Majority of the patients were from age group 41-50 years. Metabolic causes were the leading cause of seizures which accounted for (30.86%) followed by idiopathic (24.6%), CVA (24.6%), neuro infection (13.5%) and alcohol withdrawal (6.1%). GTCS was the most common type of presentation (70%) followed by focal (30%).*

Keywords: Seizures, clinico etiological, EEG

1. Introduction

Epilepsy is a condition in which recurrent seizures due to chronic underlying process are seen. Epilepsy is a clinical phenomenon than a single disease entity; since there are different forms and causes of epilepsy. [1]

Epilepsiatarda, late onset epilepsy is simply defined as epilepsy which begins in adult life.

Seizures which begin in adult life are most likely due to progressive brain disease as compared to idiopathic epilepsy, which has, its onset in childhood or youth. [2]

Epilepsy can be treated with accurate history taking, clinical examination and proper analysis of etiology supported by laboratory and radiological investigations.

Hence, this study is conducted to evaluate the clinic etiological profile of seizures in adults attending Pravara Rural Hospital, Loni.

2. Materials and Methods

Ethics committee approval:

The study was conducted after the ethics committee approval from the institutional ethics committee of Pravara Institute of Medical Sciences, Loni, Ahmednagar by submitting the synopsis mentioning all the proposed study details and necessary protocols.

Study Design: Present study was carried out as an observational cross sectional study.

Duration Of Study: September 2018 to September 2020 (2 years).

Study Setting: The study was conducted in Pravara Rural Hospital, Loni, a tertiary care teaching hospital located in the rural area of the Ahmednagar district.

Sampling Method: The sampling method used in our study was Purposive Sampling.

Sample Size Calculation: Sample size calculation was done with the help of OpenEpi, Version 3 software with the equation as mentioned below:

The sample size was 81 at 99.9% confidence limit.

Sample Size $n = [DEFF * Np (1 - p)] / [(d2 / Z2) 1 - \alpha/2 * (N - 1) + p * (1 - p)]$

Inclusion Criteria:

- 1) All patients of seizures aged ≥ 14 years admitted in Pravara Rural Hospital.
- 2) Status Epilepticus
- 3) Patient/guardian who is ready to give informed consent.

Exclusion Criteria:

- 1) Psychogenic seizures.
- 2) Eclampsia
- 3) Movement disorders.
- 4) Syncope.
- 5) Seizures secondary to trauma were excluded from our study.

Language of Interview: Subjects were interviewed according to the proforma given in annexure in the mother tongue of the patient or the language the patient best understands.

Study Protocol: Individuals with seizure disorders admitted in PRH, Loni were interviewed with a structured proforma.

Informed Written Consent: As given in annexure it was taken in the mother tongue of patient and they were assured confidentiality.

Volume 10 Issue 10, October 2021

www.ijsr.net

Licensed Under Creative Commons Attribution CC BY

Data Collection:

The data of each patient was collected on a proforma specially designed for this study and which included demographic details of patient, detailed history, clinical features, past medical history, physical examination, RFT, serum calcium, random blood sugar level, EEG, CT brain/MRI brain and other routine investigations.:

EEG Recording:

EEG recording was done for all the 81 patients. EEG recording is a dynamic procedure. It was recorded on a 16 – channel Brainwave plus EEG machine. Electrodes were placed according to 10 - 20 system. Each electrode consists of disc or cup connected to an insulated wire. EEG machine is a powerful and complex biological amplifier, which highly amplifies those potentials and produces deflections of ink writing pens.

Routine examination of the patient was done. Before doing EEG the scalp hair were well shampooed and washed with water to remove all the oil. Electrodes were applied to the scalp with the help of electrode paste. Standard EEG was run with low filter on 1 Hertz or 0.5 Hertz and high filter on 70 Hertz with speed 30mm/s. We used RMS EEG - 24 Brain view plus machine recorder and medicare system by Chandigarh. EEG was recorded in adults in montages A, B and C. Activation procedures like hyperventilation and photic stimulation were used. The recording was taken in each montage for 3 minutes and the patient is asked to perform hyperventilation for 3 minutes, post hyperventilation record was taken for 2 minutes in montage A, photic stimulation were done for 3 minutes with eyes open and eyes closed in montage B.

Blood Sugar Levels

Venous samples were sent in fluoride bulbs and were tested within 30 minutes after collection in a fully automated machine which is available in the hospital central chemical laboratory. The machine uses the colorimetric method without deproteinisation. Glucose is determined after enzymatic oxidation in the presence of glucose oxidase. The hydrogen peroxide thus produced reacts, catalyzed by peroxidase, with phenol 4 - aminophenazone to form a red violet quinonimine due as an indicator. The intensity of the final colour is directly proportional to the glucose concentration and is measured at 505 nanometers. This assay uses an endpoint method and single point calibration. Random blood sugar was detected using this method.

Renal Function Test and Serum Calcium

Venous samples were sent in red bulbs with blood collector and tested after separation of serum in a fully automated machine, the Vitros 5600 manufactured by Ortho Clinical Diagnostics which is present in the central chemical laboratory of the institute.

Data Analysis

The information collected regarding the cases were recorded in Master Chart. Data analysis was done by using STATISTICS SOFTWARE in computer. Using this software, range, frequencies, percentages, means, standard deviations, chi squares and p values were calculated. Kruskal Wallis chi - square test utilized to test the

significance of difference between quantitative variables and Yate's test for qualitative variables. Ap value less than 0.05 denotes significant relationship.

Observations and Analysis

Present descriptive study was carried out at Pravara Rural Hospital, Loni to assess the clinico etiological profile of seizures in adults. A total of 81 individuals were included in our study. This included all patients of seizures aged ≥ 14 years admitted in Pravara Rural Hospital, Loni. The results of the study are as shown below:

- Majority of the patients were in the age group 41 - 50 years (n=20) followed by 51 - 60 years (n=18). 24.69 % of the patients were in the age group of 41 - 50 years. 4.9% of patients were in the age group of >70 years. Majority of the males and females were in the 5th decade (41 - 50 years). Out of 81 patients, 45 (55%) were males and 36 (45%) were females with male to female ratio of 1.25: 1.
- Leading cause of seizures was Metabolic which accounted for 30.86%. Second most common causes were cerebrovascular accidents (24.6%) and idiopathic (24.6%). Neuroinfection accounted for 13.5% while alcohol withdrawal accounted for 6.1% of total cases of seizures.

Distribution of cases according to age

In <20 years of age group, most common cause of seizures was idiopathic (25%) followed by metabolic (8%), CVA (5%). In 21 - 30 years of age group, most common cause of seizures was neuroinfection (27%) followed by alcohol withdrawal (20%), idiopathic (15%), metabolic (12%), CVA (10%). In 31 - 40 years of age group, common cause of seizures was CVA (10%) followed by neuroinfection (9%), metabolic (8%), idiopathic (5%). In 41 - 50 years of age group, common cause of seizures was CVA (30%) followed by neuroinfection (27%), idiopathic (25%), metabolic (24%) and alcohol withdrawal (20%). In 51 - 60 years of age group most common cause of seizures was CVA (30%) followed by neuroinfection (27%), metabolic (24%), idiopathic (20%) and alcohol withdrawal (20%).

Distribution of cases according to types of neuroinfection:

Among neuroinfections, most common cause of seizures was bacterial meningitis (36%) followed by viral encephalitis (27%), tubercular meningitis (18%), neurocysticercosis (9%) and fungal i.e. cryptococcal meningitis (9%).

Distribution of cases according to types of CVA:

Among CVA, most common cause of seizure was acute ischaemic stroke (60%) which was followed by acute haemorrhagic stroke (20%), CVST (10%) and SDH (10%).

Distribution of cases according to metabolic causes:

Among all metabolic causes, commonest cause of seizure was hyponatremia (32%) followed by uraemic encephalopathy (20%), hypoglycaemia (12%), hyperglycaemia (12%), hypocalcaemia (12%), Hepatic encephalopathy (12%).

Distribution of cases having focal type of seizures according to etiology:

Most common type of seizures was GTCS. Most common cause of GTCS seizures was metabolic (30.35%) followed by CVA (28.57%), idiopathic (21.42%), neuroinfection (16%) and alcohol withdrawal (3.5%). Most common causes of focal seizures were idiopathic (32%), metabolic (32%) followed by CVA (16%), alcohol withdrawal (12%) and neuroinfection (8%).

Distribution of cases according to presenting symptoms in cases of seizures:

Most common clinical feature observed in present study was prodromal symptoms i.e. headache and vomiting which was seen in 46 cases. This was followed by bladder incontinence (40 cases), aura (33 cases), tongue bite (32 cases), neurological deficits (9 cases) and neck stiffness (5 cases).

3. Discussion

A total of 81 individuals were included in the study. This included patients of seizures aged ≥ 14 years admitted in Pravara Rural Hospital.

Age and sex distribution

In present study total 81 cases with new onset seizures were included. Among them 45 (55%) were males and 36 (45%) were females. Male to female ratio was 1.25: 1. Male preponderance was seen in our study. Similar to our study in a study conducted by Reddy GR and Vishvanayak (2019) [3] Uttar Pradesh, out of 51 patients 28 (55%) were males and 23 (45%) were females with male to female ratio of 1.22: 1.

Contrary to our study, in a study conducted by Muralidhar and Venugopal (2015) [4] out of 50 cases, 34 (68%) were males, 16 (32%) were females with male to female ratio of 2.12: 1. In contrast to our study, in a study conducted by Samir Yelwatkar et al (2019) [5] out of 130 cases with seizures, 82 (63.1%) were males and 48 (36.9%) were females with male to female ratio of 1.75: 1.

Etiology of seizure disorders:

In our study, most common cause of seizures was Metabolic (30.86%) followed by idiopathic (24.6%), CVA (24.6%), neuroinfection (13.5%) and alcohol withdrawal (6.1%).

According to Narayan T and Murthy JM (2007), [6] neuroinfection (32%), metabolic (32%), vascular (21%), idiopathic (15%) and alcohol withdrawal (6.1%).

Metabolic causes observed in various studies

In present study leading cause of seizure disorders was metabolic (30.86%). Seizures due to metabolic causes were commonly seen in age group of 41 - 50 years. Among all metabolic causes commonest cause of seizure was hyponatremia (32%) followed by uraemicencephalopathy (20%), hypoglycaemia (12%), hyperglycaemia (12%), hypocalcaemia (12%) and hepatic encephalopathy (12%).

Similar to our study, a study conducted by Narayan T and Murthy JM (2007), ⁶showed that metabolic causes were most common cause of seizures (32%). Similar to present

study in a study conducted by Reddy GR and Vishvanayak (2019) ³ Uttar Pradesh, metabolic causes accounted for 27.45% of total cases of seizures. Similar to our study in a study conducted by Kanitkar et al (2013) [7] metabolic causes accounted for 28% of total cases of seizures.

In contrast to our study, a study conducted by Pandey RP et al (2017) [8] showed that seizures due to metabolic causes accounted for 13.72% of total cases. Contrary to present study, in a study conducted by Pradeep N et al (2017); [9] and Hirani MM and ShrivastavaS (2015) [10] seizures secondary to metabolic causes were responsible for 20.3% of total cases. In contrast to our study, a study conducted by Quraishi SM et al (2015) [11] metabolic causes shared 10.3% of total cases of seizures.

Types of cerebrovascular accidents observed in various studies:

In present study cerebrovascular accidents accounted for 24.6% of total cases of seizures. This was the third leading cause of seizures in our study. CVA related seizures were more common in age group 41 - 50 years. In our study among CVA most common cause of seizures was acute ischaemic stroke (55%) followed by acute haemorrhagic stroke (20%), CVST (10%) and SDH (10%). Similarly, in a study conducted by Narayan T and Murthy JM (2007), [12] CVA accounted for 21% of total cases.

Contrary to present study, a study conducted by Sander JWAS et al (1990) UK, [13] CVA accounted for 15% of total cases and was the most common cause of seizures. In contrast to our study, a study conducted by Murthy JMK and Yangala R (1990) [14] Hyderabad, CVA accounted for 14% of total cases of seizures.

Contrary to our study, in a study conducted by Annegers JF et al (1995) USA, [15] CVA accounted for 80% of total cases of seizures whereas in a study conducted by Reddy GR and Vishvanayak (2019) ³Uttar Pradesh, 43.1% seizures were caused due to CVA. Contrary to our study, in a study conducted by Kanitkar SA et al (2013) [16] stroke was most common cause of seizures (44%) (66).

Idiopathic causes of seizures in various studies:

In present study, idiopathic causes of seizures accounted for 24.6% of total cases of seizures. Similar results were seen in a study conducted by KaurS et al (2018) [17] in which idiopathic cases of seizures were 22% of total cases of seizure disorders. Similar results to our study were also seen in a study conducted by Pannem RB et al (2019) [18] in which idiopathic causes accounted for 17.75% of total cases of seizures.

Contrary to our study, studies conducted by Sander JWAS et al (1990), ¹³Annegers JF et al (1995) ¹⁵showed that idiopathic causes of seizures were responsible for 68% and 50% of total cases of seizures respectively.

Neuroinfections observed in various studies:

In a study conducted by Pannem RB et al (2019) ¹⁸cerebral malaria accounted for 10.20% of the total cases of seizures secondary to neuroinfection. In a study conducted by KaurS et al (2018) ¹⁷ brain abscess and cerebral malaria accounted

for 5% each of total cases of seizures secondary to neuroinfection. In a study conducted by Murthy JMK and Yangala R (1990) ¹⁴ brain abscess contributed to 0.5% of total cases of seizures caused due to neuroinfection.

Contrary to our study, in a study conducted by Murthy JMK and Yangala R (1990) ¹⁴ Hyderabad, neuroinfections were responsible for 52% of total cases of seizures (74) whereas it was 32% in a study conducted by Narayan T and Murthy JM (2007).¹²

Alcohol withdrawal as a cause of seizures:

Alcohol withdrawal seizures were most common in age group of 61 - 70 years. They were responsible for 6.1% of total cases of seizures. Similar to our study, in a study by Sander JWAS et al (1990), ¹³ alcohol withdrawal was responsible for 6% of total cases of seizures. Similar to our study in a study conducted by Ashwin T et al (2017) [19] alcohol withdrawal seizures contributed 5% of total cases of seizures.

Association of etiology and type of seizures:

Most common type of seizure that was observed was GTCS (70%). Most common cause of GTCS seizure was metabolic (30.35%) followed by cerebrovascular accident (28.5%). Focal seizures accounted for 30% of total seizures. Most common cause of focal seizure was idiopathic (32%) and metabolic (32%) followed by CVA (16%).

Similar to our study, in a study conducted by Kanitkar SA et al (2013), ⁷ and Hirani MM, Shrivastava S (2015) ¹⁰ maximum number of patients were of GTCS seizure type in adults (70%, 64% and 60% respectively). Similar to our study, in a study conducted by Reddy GR and Vishvanayak (2019) ³ Uttar Pradesh it was observed that GTCS was the most frequently observed seizure type seen in 76.5% of study population whereas in 23.5% it is focal in onset

Clinical features associated with seizures:

In present study most common clinical feature was prodromal symptoms (headache and vomiting) (46 cases) followed by bladder incontinence (40 cases), aura (33 cases), tongue bite (32 cases) and focal neurologic deficit (9 cases). Participants with tongue bite were predominantly affected by GTCS. A similar study by Benbadis SR (1995) [20] et al showed that tongue bite was highly specific for GTCS. A meta - analysis by Francesco Brigo also favoured that tongue bite was more specific of epileptic seizures particularly GTCS. [21] However this finding was not statistically significant in our study. A larger sample would make this finding statistically significant. Participants with auras like lip smacking and automatisms were predominantly affected by focal seizures.

4. Limitations

- We were unable to study morbidities like neurological dysfunction and impact on Disability Adjusted Life Years (DALY), as regular follow up could not be ensured owing to various factors like distance, monetary issues etc.
- Other limitation of the study was the small sample size and the findings of this study were not reflective of the general population as it was a single tertiary care centre

study. Therefore, Multi - centric prospective studies with larger sample size are recommended to overcome these limitations.

5. Conclusions

- Metabolic causes of seizures accounted for significant number of seizures in all age groups (30.86%) followed by idiopathic (24.6%), CVA (24.6%), neuro infections (13.5%) and alcohol withdrawal (6.1%).
- Hyponatremia (32%) was the most common metabolic cause of seizure.
- Acute ischaemic stroke (60%) was the most common cause of seizures in CVA patients.
- Bacterial Meningitis (36%) was the most common cause of seizures in neuro infection.
- GTCS (70%) was more common than focal (30%) type of seizures.
- Prodromal symptoms (headache and vomiting) (57%) were most common associated clinical features.

References

- [1] Orrin Devinsky. The falling sickness. A guide to understanding and living with epilepsy, the history of epileptic therapy. DF Scott.
- [2] Bharuch NE. Epidemiology of epilepsy in India. *Epilepsia* 2003; 44(1):9-11.
- [3] Reddy GR, Vishvanayak. Clinicoetiological profile of new onset seizures in geriatric patients at a tertiary care hospital. *Acad J Med* 2019;2 (2):195-99.
- [4] Muralidhar V, Venugopal K. New onset seizures: Etiology and co- relation of clinical features with computerized tomography and electroencephalography. *J Sci Soc* 2015;42:82-7
- [5] Yelwatkar S, Pethe M, Pangul M. Prospective observational study of etio-pathogenesis, clinical profile and hospital outcome after antiepileptic treatment in patients with seizures. *International Journal of Biomedical and Advance Research* 2019;10(7):e5223.
- [6] Narayan T, Murthy JM. New onset acute symptomatic seizures in a neurological Intensive Care Unit. *Neuro India* 2007;55:136-40.
- [7] Kanitkar SA, Gaikwad AN, Kalyan M, Aarwal R, Krupal K, Tamakuwala KK, et al. Study of seizure disorder in elderly: Etiology, types, EEG and image findings. *Transworld Med J* 2013;1:24-5.
- [8] Pandey RP, Chaurasia A, Ahuja S, Betageri P, Indurka M. A study of clinical profile of seizure disorder in geriatric population. *Sch J App Med Sci* 2017;5:237-243.
- [9] Pradeep N, Jithendra HC. A prospective study to determine the most prevalent seizure type and the age group involved in epilepsy. *International Journal of Contemporary Medical Research* 2017;4(8):1804-1806
- [10] Hirani MM, Shrivastava S. Clinical profile of new onset seizures in adults. *Indian J Appl Res* 2015;5:19-21
- [11] Quraishi SMS, Rani PSU, Prasanthi P et al. Etiological Profile of New Onset Seizures. *Journal of Evidence based Medicine and Healthcare* 2015;2(41):7032-7044.

- [12] Narayan T, Murthy JM. New onset acute symptomatic seizures in a neurological Intensive Care Unit. *Neurol India* 2007;55:136-40
- [13] Sander JW, Hart YM, Johnson AL, Shorvon SD. National General Practice Study of Epilepsy: newly diagnosed epileptic seizures in a general population. *Lancet* 1990;336(8726):1267-71.
- [14] Murthy JMK, Yangala R. Acute symptomatic seizures – incidence and etiological spectrum: a hospital based study from South India. *Seizure* 1999;8:162-165.
- [15] Annegers JF, Hauser WA, Lee JRJ, Rocca W. Incidence of acute symptomatic seizures in Rochester, Minnesota, 1935 -1984. *Epilepsia* 1995;36:327-333.
- [16] Kanitkar SA, Gaikwad AN, Kalyan M, Aarwal R, Krunal K, Tamakuwala KK, et al. Study of seizure disorder in elderly: Etiology, types, EEG and image findings. *Transworld Med J* 2013; 1: 24-5.
- [17] Kaur S, Garg R, Aggarwal S, Chawla SP, Pal R. Adult onset seizures: Clinical, etiological and radiological profile. *J Family Med Prim Care* 2018;7:191-7
- [18] Pannem RB, Chintha VS. Aetiology of new onset seizures in cases admitted to an intensive care unit of a tertiary care hospital: a two year study. *Int J Adv Med* 2019.
- [19] Ashwin T, Tumbanatham A, Green SR, Singh KJ. Clinico etiological profile of seizures in adults attending a tertiary care hospital. *Int J Adv Med* 2017;4:490-6.
- [20] Benbadis SR, Wolgamuth BR, Goren H, Brener S, Fouad-Tarazi F. Value of tongue biting in the diagnosis of seizures. *Arch Intern Med* 1995;155(21):2346-9.
- [21] Brigo F, Nardone R, Bongiovanni LG. Value of tongue biting in the differential diagnosis between epileptic seizures and syncope. *Seizure- Eur J Epilepsy* 2012;21(8):568-72.