

**Original Article****Study of CNS Infection As A Cause of New Onset Seizure with Special Reference to Tuberculosis**

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Email: shishir.pandey2001@gmail.com Cell: 7354708185**ABSTRACT****INTRODUCTION:** *Seizures are common disorders found all over the world and are encountered frequently during medical practice in variety of settings.**Etiological spectrum of acute symptomatic seizures in developing countries is different from developed countries. The major etiological risk factors were central nervous system (CNS) infections (32%), metabolic disorders (32%) and cerebrovascular diseases (21%).¹ Presently CNS infections like malaria, meningitis, tuberculosis, Human Immunodeficiency Virus (HIV) and neurocysticercosis account for significant number of cases in developing countries.² Since these infections vary from region to region; etiology of seizure may also vary from region to region.***AIMS AND OBJECTIVE:** *(1) To study distribution of CNS infection as a cause of new onset seizure. (2) To study types of CNS tuberculosis which cause new onset seizure.***MATERIALS AND METHODS:** *100 patients admitted with new onset seizures from the hospital attached to S. S. Medical College, REWA and study conducted from July 2014 to October 2015. Seizure history was taken from eyewitness and patient and clinical examination and routine investigation done, with special investigation like CT, MRI, EEG in selected cases. Result was analysed statically and mean and standard deviation was calculated.***RESULT:** *CNS infection constitute major portion of new onset seizure (31%). Out of these Neurocysticercosis (32.2%), tuberculosis (25.8%), bacterial meningitis (16.1%), cerebral malaria (16.1%), viral meningitis and encephalitis (9.67%). Tubercular infection constitute tuberculoma (62.5%), tubercular meningitis (25%), and tubercular meningoencephalitis (12.5%) cases.***CONCLUSION:** *CNS infection (31%) were the leading cause of seizure and among these majority of seizures were because of Neurocysticercosis. Also Neurocysticercosis can be easily prevented by maintaining good hygiene, sanitary conditions and avoiding open defecation.***KEYWORDS:** *CNS infection, seizure, tuberculosis.*

INTRODUCTION

Seizure has been a recognized entity since antiquity and is probably as old as man himself. About 65 million people worldwide have epilepsy and nearly 80 per cent of the person with epilepsy (PWE) live in developing countries, where annual new cases occur between 40 to 70 per 100,000 people in the general population. The estimated proportion of the general population with active epilepsy at a given time is between 4 to 10 per 1000 people. However, some of the studies from developing countries suggest that the proportion is between 6 to 10 per 1000⁴. It is estimated that there are more than 10 million PWE in India

Epilepsy is a cost intensive disorder. The total economic burden of epilepsy in India was found to be Rs. 68.75 billion (1.72 billion USD) which constituted 0.5 per cent GNP of India. There are global disparities in the care of people with epilepsy between high and low income countries and between rural and urban settings. However, more than 70 per cent of patients who are treated achieve long-term remission or freedom from seizures, usually within five years of diagnosis⁴

Etiological spectrum of acute symptomatic seizures in developing countries is different from developed countries. The major etiological risk factors were central nervous system (CNS) infections (32%), metabolic disorders (32%) and cerebrovascular diseases (21%).¹ Presently CNS infections like malaria, meningitis, tuberculosis, Human Immunodeficiency Virus (HIV) and neurocysticercosis account for significant number of cases in developing countries.² Since these infections vary from region to region; etiology of seizure may also vary from region to region.

Single small enhancing CT lesions (SSECTL) (ring enhancing/disc lesions, 20 mm in size) are an important cause of seizures in India. Initially it was thought that SSECTL were because of tuberculosis, focal encephalitis, microabscesses and cysticercosis but now histopathological studies suggest that in most of the cases SSECTL is because of dying cysticercus larva.³

Seizures can be presenting feature in tubercular meningitis, which is most common type of

chronic meningitis in India. More than 60% of patients with intracranial tuberculoma may have seizures.²

With the advent of modern technologies like CT scan, MRI and CSF serology for infection like viral, tubercular, neurocysticercosis, the diagnosis of seizure has become more accurate and has completely changed the course of management.

Most of the cause of seizure is reversible and preventable, therefore this study was invised to deleneate the various CNS infection which cause new onset seizures in this region.

MATERIALS AND METHODS

100 patients admitted with new onset seizures from the hospital attached to S. S. Medical College, REWA. Study began on July 2014 and ended on October 2015. Patients presenting with history of new onset seizures were included in the study. Patient and eyewitness were interviewed regarding history, and clinical examination was done as mentioned in proforma.

The investigations included haemoglobin level, total count, differential count, ESR, urine routine, blood urea, serum creatinine, blood glucose levels, liver function test and estimation of serum electrolytes like sodium and potassium.

Special investigations like lumbar puncture, serological tests, CT scan or MRI brain, EEG were done in selected cases. The collected data was analysed using the computer programme Statistical Package for Social Sciences (SPSS 11.0) and Systat 8.0. Microsoft word and Excel have been used to generate tables etc.

Descriptive analysis was used to compute percentage, to calculate Mean and Standard deviation

OBSERVATION

Table 1 Etiological pattern of CNS infection in new onset seizure (n=100)

ETIOLOGY	Number and %
Neurocysticercosis	10 (32.2%)
Tuberculosis	8(25.8%)
Bacterial meningitis	5(16.1%)
Cerebral malaria	5(16.1%)
Viral meningitis and encephalitis	3(9.67%)
TOTAL	31(31%)

In the present study, CNS infection was the leading cause of seizure which accounted for 31% of cases, Among, Neuroinfections, Neurocysticercosis accounted for 32.2% of seizures followed by Tuberculosis 25.8%, Bacterial meningitis 16.1%, Cerebral malaria 16.1%.

Cns infection occurred in 15% cases in study by Hauser⁵ et al, 32% cases in a study by Narayanan JT and Murthy JMK⁶, 39.70% cases in study by Sudhir chalasani⁷ et al and 38 % cases in study by Quraishi⁸ et al . In the present study etiology is comparable to Indian studies.

In the study by Sudhir Chalasani⁷ et al, NCC accounted for 30.4% and in present study NCC accounted for 32.2 % of cases. This may be because of regional variation in incidence of Neurocysticercosis.

Table: 2 Types of CNS tuberculosis in patients with seizure :-

CNS Tuberculosis	Number[n=8] and %
Tuberculoma	5 (62.5%)
Tubercular meningities	2 (25%)
Tubercular Meningoencephalitis	1 (12.5%)
TOTAL	8

CNS Tuberculosis as a cause of seizures accounted for 8% of total cases. Among these, tuberculoma accounted for (62.5%) of seizures followed by tubercular meningities (25%) and Meningoencephalitis (12.5%). This is the same as study done by Bahemuka M, Murungi JH⁹ et al .

CONCLUSION

Etiology of seizure vary from region to region, in developing countries like India CNS infection (31%) still an important cause of new onset seizure and among these majority of seizures were because of Neurocysticercosis which can be easily prevented by maintaining good hygiene, sanitary conditions and avoiding open defecation and regular deworming of population .

REFERENCES

1. Jaishree T Narayanan, JMK Murthy New-onset acute symptomatic seizure in a neurological intensive care unit Year : 2007 | Vol: 55 | Issue : 2 | Page : 136
2. Murthy JMK, Yangala R. Acute symptomatic seizures — incidence and etiological spectrum: a hospital-based study. *Seizure* 1999; 8:162-165.
3. Thussu A, Arora A, Prabhakar S, Lal V, Sawhney IM. Acute symptomatic seizures due to single CT lesions: how long to treat with antiepileptic drugs?. *Neurol India* 2002; 50:141-4.
4. Man mohan mehndiratta et al, International Epilepsy Day - A day notified for global public education & awareness. *Indian J Med Res* 141, Feb 2015, pp 143-144
5. Annegers JF, Hauser WA, Lee JRJ, Rocca W. Incidence of acute symptomatic seizures in Rochester, Minnesota, 1935–1984. *Epilepsia* 1995; 36:327–333
6. Narayanan JT, Murthy J. New-onset acute symptomatic seizure in a neurological intensive care unit. *Neurol India* 2007; 55:136-140.
7. Dr. Sudhir Chalasani, Dr. M. Ravi Kumar , Clinical Profile and Etiological Evaluation of New Onset Seizures *e-ISSN: 2279-0853, p-ISSN: 2279-0861. Volume 14, Issue 2 Ver. VII (Feb. 2015), PP 97-101*
8. S. M. Saifullah Quraishi, P. S. Usha Rani, P. Prasanthi, P. Sudhakar. “Etiological Profile of New Onset Seizures”. *Journal of Evidence based Medicine and Healthcare*; Vol. 2, Issue 41, Oct 12,2015; Page: 7032-7044, DOI: 10.18410/jebmh/2015/960
9. Bahemuka M, Murungi JH et al Tuberculosis of the nervous system. A clinical, radiological and pathological study of 39 consecutive cases in Riyadh, Saudi Arabia. *J Neurol Sci* 1989; 90:67.