



## **Clinical profile and outcome in children suffering from AES (Acute encephalitic syndrome) in Magadh region of Bihar**

**Dr. Vinay Kumar<sup>1</sup>, Dr. Mani Bhushan<sup>2</sup>, Dr. Archana Bharti<sup>3</sup>, Dr. Bankey Behari<sup>4</sup>**

<sup>1,2</sup> Assistant Professor, Department of Paediatrics, Anugrah Narayan Magadh Medical College and Hospital, Gaya Bihar, India

<sup>3</sup> Senior Resident, Department of Biochemistry, AIIMS, Patna, Bihar, India

<sup>4</sup> Associate Professor and HOD, Department of Paediatrics, Anugrah Narayan Magadh Medical College and Hospital, Gaya Bihar, India

### **Abstract**

Acute encephalitis syndrome (AES) is a term used by WHO for syndromic surveillance in the context of Japanese encephalitis (JE). Encephalitis is inflammation of the brain. Symptoms may include headache, fever, confusion, a stiff neck, and vomiting. Complications may include seizures, hallucinations, trouble speaking, memory problems, and problems with hearing.

The study was planned in Department of Paediatrics in Anugrah narayan magadh medical college and hospital. The data from the 100 patients were collected and presented as below. All the patients were undergone CSF analysis, Fundus examination, Montoux test, Chest X - ray, CT Brain, MRI Brain, EEG, Virological studies.

This data would be useful to paediatrician in the evaluation and management of children with suspected viral encephalitis admitted in the hospital and assist the public health authorities in acute encephalitis surveillance to formulate a policy in our region to minimize the burden of this devastating neurological disease in the high risk paediatric population through effective preventive measures.

**Keywords:** Japanese encephalitis, AES (ACUTE encephalitic syndrome, epidemiological, geographical etc.

### **Introduction**

Acute encephalitis syndrome (AES) is a term used by WHO for syndromic surveillance in the context of Japanese encephalitis (JE). Encephalitis is inflammation of the brain. Severity is variable. Symptoms may include headache, fever, confusion, a stiff neck, and vomiting. Complications may include seizures, hallucinations, trouble speaking, memory problems, and problems with hearing <sup>[1]</sup>.

Causes of encephalitis include viruses such as herpes simplex virus or rabies, bacteria, fungus, or parasites. Other causes include autoimmune diseases and certain medication. In many cases the cause remains unknown. Risk factors include a weak immune system. Diagnosis is typically based on symptoms and supported by blood tests, medical imaging, and analysis of cerebrospinal fluid <sup>[2]</sup>.

Certain types are preventable with vaccines. Treatment may include, antiviral medication (such as acyclovir), anticonvulsants, and corticosteroids. Treatment generally takes place in hospital. Some people require artificial respiration <sup>[1]</sup>. Once the immediate problem is under control, rehabilitation may be required <sup>[2]</sup>. In 2015, encephalitis was estimated to have affected 4.3 million people and resulted in 150,000 deaths worldwide <sup>[3, 4]</sup>.

People should only be diagnosed with encephalitis if they have a decreased or altered level of consciousness, lethargy, or personality change for at least twenty-four hours without any other explainable cause. Diagnosing encephalitis is done via a variety of tests <sup>[5]</sup>.

- Brain scan, done by MRI, can determine inflammation and differentiate from other possible causes.
- EEG, in monitoring brain activity, encephalitis will

produce abnormal signal.

- Lumbar puncture (spinal tap), this helps determine via a test using the cerebral-spinal fluid, obtained from the lumbar region.
- Blood test
- Urine analysis
- Polymerase chain reaction (PCR) testing of the cerebrospinal fluid, to detect the presence of viral DNA which is a sign of viral encephalitis <sup>[20]</sup>.

Acute encephalitis syndrome (AES) is characterized by an acute onset of fever and clinical neurological manifestation that includes mental confusion, disorientation, delirium, or coma. Viruses have been mainly attributed to be the cause of AES in India although other sources such as bacteria, fungus, parasites, spirochetes, chemical, and toxins have been reported over the past few decades. Apart from viral encephalitis, severe form of leptospirosis and toxoplasmosis can cause AES. The causative agent of AES varies with season and geographical location, and predominantly affects population below 15 years <sup>[6]</sup>. Keeping in mind the wide range of causal agents and the rapid rate of neurological impairment due to pathogenesis, clinicians face the challenge of a small window period between diagnosis and treatment. The present report is based on results obtained after reviewing various surveillance and outbreak investigations illustrating how the perspective of AES has changed in India over the years.

The history of AES in India has paralleled with that of the Japanese encephalitis virus (JEV) since the first report in 1955 from Vellore, Tamil Nadu. The first outbreak of JEV was reported in Bankura district, West Bengal in 1973. Thereafter,

sporadic cases of AES and outbreaks have been the leading cause of premature deaths due to the disease in India. Based on various surveillance reports and outbreak investigations, Joshi *et al.* [1], classified the history of AES in India into 3 phases: (a) period before 1975 when a few cases with JE aetiology were identified; (b) between 1975 and 1999 when more JEV cases were reported with frequent outbreaks that resulted in the development of JE endemic regions near the Gangetic plains and in parts of Deccan and Tamil Nadu; (c) between 2000 and 2010, a dramatic change was observed in the AES scenario, which saw the rise in non-JE outbreaks mostly caused by viruses such as Chandipura virus (CHPV), Nipah virus (NiV), and other enteroviruses.

Viruses have been mainly attributed to be the cause of AES in India although other probable causes such as bacteria, fungus, parasites, Spirochetes, Leptospira, Toxoplasma, certain chemicals, and toxins have been reported over the past few decades. Japanese Encephalitis is one of the type of AES which is caused by a virus transmitted by bites of female mosquitoes mainly belonging to Culex species. This virus is maintained in animals, birds and pigs. Originally it was thought that Japanese Encephalitis and AES cases are seasonal in nature, but Patna Medical College and Hospital being a tertiary centre with vast catchment area covering the whole state of Bihar, parts of Jharkhand, Uttar Pradesh and Nepal. Hence the study was planned to assess the clinical profile of the children affected by Acute Encephalitic Syndrome (AES).

### Methodology

The study was planned in Department of Paediatrics in Anugrah Narayan Magadh Medical College and Hospital. The data from the 100 patients were collected and presented as below. The approval of the institutional ethics committee had been taken before the study. All the patients were informed consent. The aim and the objective of the study are conveyed to all patients.

**Inclusion Criteria:** All the children who were admitted in the Pediatric ward over a period of one year with clinical features of fever, seizures, altered sensorium were included in the study.

**Exclusion Criteria:** Cases which turned out to be positive for Bacterial / TB meningoencephalitis, febrile seizures were excluded from study.

All the patients were undergone CSF analysis, Fundus examination, Montoux test, Chest X-ray, CT Brain, MRI Brain, EEG, Virological studies.

### Result & Discussion

The data from the 100 Encephalitic patients were collected and presented as below. The table 1 shows the data of the patients related to age group, type of sex and the rural or urban origin of the patients.

**Table 1:** Age, sex & geography

Age	No. of Cases	Sex	No. of Cases	Geographic Origin	No. of Cases
Less than 1 year	21	Male	65	Rural	89
1-3 years	19	Female	35	Urban	11
3 – 7 years	40				
7 - 10 years	20				

**Table 2:** Clinical signs

Clinical Sign	No. of Cases
Speech disturbance	10
Cranial nerve involvement	18
Motor deficit	35
Cerebellar signs	4
Involuntary movements	9
Meningeal signs	79
Papilloedema	12

**Table 3:** Death occurrence

In days	No. of death
Within 1 week	7
Within 2 weeks	5
Within 3 weeks	3

Viral encephalitis is an important cause of mortality and morbidity in children. Viral agents responsible for sporadic encephalitis include Varicella zoster virus, Mumps, Human herpes virus 6 and 7, Epstein Barr virus, and most importantly, Herpes simplex virus. Herpes simplex virus encephalitis (HSE) is the most common cause of sporadic fatal viral encephalitis, with an incidence of 1-3/million in western

countries [7]. Not much information is available regarding proportion of AES cases due to HSE in the Indian setting. In untreated patients, mortality is high (70%), which is decreased to 30% in treated patients in a timely manner with the antiviral drug Acyclovir (risk of sequelae of around 11%) [8].

Acute encephalitis syndrome (AES) is a term used by WHO for syndromic surveillance in the context of Japanese encephalitis (JE) [9]. Acute Encephalitis Syndrome is defined clinically as a person of any age, at any time of year with the acute onset of fever and a change in mental status (including symptoms such as confusion, disorientation, coma, or inability to talk) AND/OR new onset of seizures (excluding simple febrile seizures). Acute encephalitis syndrome is a medical and neurological emergency, requiring immediate consideration of key issues including immediate life support, identification of cause, and when available, institution of specific therapy.

In our study, we tried to know the incidence & etiology of Viral Encephalitis, its relation to age, sex, geographical distribution and seasonal variation, the clinical manifestations and tried to look at the mortality, morbidity and neurological sequelae to make the necessary recommendations to the public health authorities. We also tried to find out the JE positivity among the clinical acute encephalitis syndrome (AES) cases

referred to our center based on serology and imaging studies and looked at other details like rural vs urban predominance, duration of hospital stay and clinical outcome with respect to timing of presentation to the hospital and duration of stay in the hospital.

This data would be useful to paediatrician in the evaluation and management of children with suspected viral encephalitis admitted in the hospital and assist the public health authorities in acute encephalitis surveillance to formulate a policy in our region to minimize the burden of this devastating neurological disease in the high risk paediatric population through effective preventive measures.

### Conclusion

Viral encephalitis is an important cause of mortality and morbidity in children. Japanese encephalitis (JE)-epidemics have been reported in many parts of our country. The incidence of JE in recent times is showing an increasing trend. It appears that JE may become one of the major public health problems in India, considering the quantum of the vulnerable paediatric population, the proportion of JEV infections among the encephalitic children and wide scattering of JE-prone areas and expansion of the disease into JE non-endemic areas, which cannot be ignored.

### References

1. Meningitis and Encephalitis Information Page. NINDS. Archived from the original on. Retrieved, 2017.
2. Meningitis and Encephalitis Fact Sheet. National Institute of Neurological Disorders and Stroke. Archived from the original, 2017.
3. GBD Disease and Injury Incidence and Prevalence Collaborators, 2015-2016.
4. GBD Mortality and Causes of Death Collaborators, 2015, 2016.
5. NHS Choices. Archived from the original, 2016-2017.
6. Joshi R, Kalantri SP, Reingold A, Colford JM., Jr Changing landscape of acute encephalitis syndrome in India: a systematic review. *Natl Med J India*. 2012; 25:212-220.
7. Steiner I. Herpes simplex virus encephalitis: new infection or reactivation? *Curr Opin Neurol*. 2011; 24:268-74.
8. Granerod J, Ambrose HE, Davies NW, Clewley JP, Walsh AL, Morgan D. *et al*. Causes of encephalitis and differences in their clinical presentations in England: a multicentre, population-based prospective study. *Lancet Infect Dis*, 2010; 10:835-44.
9. World Health Organisation. Acute Encephalitis Syndrome. Japanese encephalitis surveillance standards. January 2006. From WHO-recommended standards for surveillance of selected vaccine-preventable diseases. WHO/V&B/03.01. Available from: <http://www.who.int/vaccines-documents/DocsPDF06/843.pdf>. Accessed on.