STANDARD TREATMENT WORKFLOW (STW)
ACUTE ENCEPHALITIS SYNDROME — (AES) IN CHILDREN

Shally Awasthi¹, Sushil Kabra², Neelam Mohan³, Pushpa Kini⁴, Suvasini Sharma⁵, Joseph Mathew⁶, Surjit Singh⁷, Kuldeep Singh⁸, Himanshu Chaturvedi⁹, Shinjini Bhatnagar¹⁰
¹King George’s Medical University, Lucknow; ²All India Institute Of Medical Science, New Delhi; ³Medanta, Gurgaon; ⁴Kasturba Medical College, Manipal; ⁵Lady Hardinge Medical College, New Delhi; ⁶Postgraduate Institute of Medical Education and Research, Chandigarh; ⁷Postgraduate Institute of Medical Education and Research, Chandigarh; ⁸All India Institute Of Medical Science, Jodhpur; ⁹Balrampur Hospital, Lucknow; ¹⁰Translational Health Science and Technology Institute (THSTI), Faridabad

CORRESPONDING AUTHOR
Dr. Shally Awasthi, Professor & Head, Department of Paediatrics, King George’s Medical University, Lucknow Uttar Pradesh 226003
Email: shally07@gmail.com

CITATION
Awasthi S, Kabra S, Mohan N, Kini P, Sharma S, Mathew J, Singh S, Singh K, Chaturvedi H, Bhatnagar S. ACUTE ENCEPHALITIS SYNDROME —(AES) IN CHILDREN. Journal of the Epidemiology Foundation of India. 2024;2(1Suppl):S01-S02. DOI: https://doi.org/10.56450/JEFI.2024.v2i1Suppl.001
This work is licensed under a Creative Commons Attribution 4.0 International License.
©The Author(s). 2024 Open Access

DISCLAIMER
This article/STW, was originally published by Indian Council of Medical Research (ICMR) under Standard Treatment Workflow. The reprinting of this article in Journal of the Epidemiology Foundation of India (JEFI) is done with the permission of ICMR. The content of this article is presented as it was published, with no modifications or alterations. The views and opinions expressed in the article are those of the authors and do not necessarily reflect the official policy or position of JEFI or its editorial board. This initiative of JEFI to reprint STW is to disseminate these workflows among Health Care Professionals for wider adoption and guiding path for Patient Care.

---

**SYMPTOMS**
- Acute onset of fever (± 5-7 days) with altered sensorium and/or new onset of seizures (excluding simple febrile seizures)
- Fever, headache, vomiting, lethargy, unconsciousness
- Seizures
- Abnormal posturing
- Paucity of limb movements

**ADDITIONAL INFORMATION (HISTORY OF)**
- Rash, vesicles, past history of chicken pox
- Residence of child: rural/urban, endemic for cerebral malaria, any epidemic of AES in neighborhood
- Animal contact, insect bite, dog bite
- Drug or toxin exposure; enquire for presence of any drugs at home
- Recent travel
- Trauma
- Seizures
- Recent immunizations
- Recurrent episodes of encephalopathy
- Past or concurrent systemic illness
- Pre-morbid developmental/neurological status of the child
**Awasthi S, et al: Acute Encephalitis Syndrome (AES) in Children**

**Standard Treatment Workflow (STW) for the Management of ACUTE ENCEPHALITIS SYNDROME (AES) IN CHILDREN**

**ICD-10-G04**

### Symptoms
- Fever, headache, vomiting, lethargy, unconsciousness
- Seizures
- Abnormal postureing
- Ataxia
- Paucity of limb movements
- Rash, vesicles, past history of chicken pox
- Illnesses of child: nausea, vomiting, diarrhea, high fever
- Drug or toxin exposure: enquire for presence of any drugs at home
- Recent travel
- Recent illnesses
- Recent immunizations
- Recent episodes of encephalopathy
- Past or concurrent systemic illness
- Pre-morbid developmental/ neurodevelopmental status of the child

### Additional Information (History of)

#### General Examination
- Pulse
- Respiratory rate
- Blood pressure

#### Neurological Examination
- Level of consciousness by Glasgow Coma Scale (GCS)
- Abnormal posturing, decorticate, decerebrate
- Active seizure
- Cranial nerves: pupil size and reaction, doll’s eye movements, squint, facial deviation
- Focal neurological deficits
- Movements signs

### Examination

#### Vital Signs
- Temperature
- Pulse rate
- Respiratory rate
- Blood Pressure

#### General Examination
- Pupils
- Mucous Membrane
- Skin

### Investigative

#### Essential
- CBC, LFT, KFT, blood sugar, CSE, Brain, CSF examination (cytology, biochemistry, culture, AFB staining, Cerebrospinal fluid examination for material parasite, Rapid Malaria Antigen test)

#### Desirable
- MRI Brain, CSF PCR for herpes simplex encephalitis, 3D neuroimaging, EEG, ECG, electrocardiography and NIV testing, IV testing

#### Optional
- CSF Neuraminidase pan, anti-MIC antibodies, PCR viral culture of other samples (throat swab, nasopharyngeal aspirate, stool etc.), Blood Transmitted Disease Screening (syphilis, malaria, hepatitis B, HIV, and tuberculosis), Urine for erythrocytes and leukocytes

#### Lumbar puncture contra-indicated or neuroimaging must be obtained before lumbar puncture

#### 1. Treatment with antiviral and antiepileptic agents

#### 2. All patients need to be admitted

**Step 1:** Rapid assessment and stabilization
- Establish and maintain airway intake (if possible); send CSF, blood, urine samples for relevant investigations
- Fluid balance: intravenous fluid (30 mL/kg in 24 hours)
- Ventilation: start emergency ventilation
- Oxygen therapy: start oxygen therapy
- Body temperature: start cooling
- Sugar (sugar in CSF)/ electrolyte abnormalities: start sugar (sugar in CSF)
- Seizure: start anticonvulsant therapy

**Step 2:** History, Examination, and Investigations as given above

**Step 3:** Empirical treatment (should be started if CSF cannot be done; report will take time and patient is critical)
- Ceftriaxone 100 mg/kg/day in divided dosages every 12-14 hours
- Acyclovir (use in all suspected sporadic viral encephalitis)
- Intravenous fluid (3 cc/kg/hr) in 24 hours
- Temperature: start rectal or oral
- Antihypertensives: start antihypertensives
- Epilepsy: start anticonvulsant therapy

**Step 4:** Supportive care and treatment
- Maintain eucapnia, hydration, and control fever
- Treat seizures
- In case of increase in intracranial pressure, maintain ICP in 15-20 mmHg
- Treat diabetes: start anticonvulsant therapy and start antidiabetes
- Start antitoxins: start antitoxins
- Start anticonvulsant therapy and start antidiabetes
- Start antitoxins: start antitoxins

**Management of raised intracranial pressure**

- Maintain normal/increased ICP: administer acetazolamide
- Maintain ICP below 20 mmHg
- Avoid repeated lumbar punctures
- Avoid sedatives and analgesics
- Avoid rectal thermometer

**Drug Treatment of seizures**

1. 1st Line (V: Conventional): Phenobarbitone 0.2 mg/kg/day or Dexamethasone 0.5 mg/kg/day
2. 2nd Line (V: Phenobarbitone 0.2 mg/kg/day)
3. 3rd Line (V: Phenytoin 0.2 mg/kg/day)

**Discharge criteria**

- Genitally stable
- Improvement in consciousness
- Able to sit
- Has started eating and drinking orally
- Referred to rural or urban hospital

**Parents have been explained the supportive care and physiotherapy to be continued at home**

**References**