

Case Management of Acute Encephalitis Syndrome/Japanese Encephalitis

Case Definition of Suspected case:

- Acute onset of fever, not more than 5-7 days duration.
- Change in mental status with/ without
 - New onset of seizures (excluding febrile seizures)
 - (Other early clinical findings – may include irritability, somnolence or abnormal behavior greater than that seen with usual febrile illness)

Important

- In an epidemic situation fever with altered sensorium persisting for more than two hours with a focal seizure or paralysis of any part of body, is encephalitis.
- Presence of rash on body excludes Japanese Encephalitis.
- AES with symmetrical signs and fever is likely to be cerebral Malaria.

Case Classification:

Laboratory-Confirmed case : A suspected case with any one of the following markers:

- Presence of IgM antibody in serum and/ or CSF to a specific virus including JE/Enterovirus or others
- Four fold difference in IgG antibody titre in paired sera
- Virus isolation from brain tissue
- Antigen detection by immunofluorescence
- Nucleic acid detection by PCR

In the sentinel surveillance network, AES/JE will be diagnosed by IgM Capture ELISA, and virus isolation will be done in National Reference Laboratory.

Probable Cases

Suspected case in close geographic and temporal relationship to a laboratory-confirmed case of AES/JE in an outbreak

Acute Encephalitis Syndrome due to other agent

A suspected case in which diagnostic testing is performed and an etiological agent other than AES/JE is identified

Acute Encephalitis Syndrome due to unknown agent

A suspected case in which no diagnostic testing is performed / no etiological agent is identified / test results are indeterminate

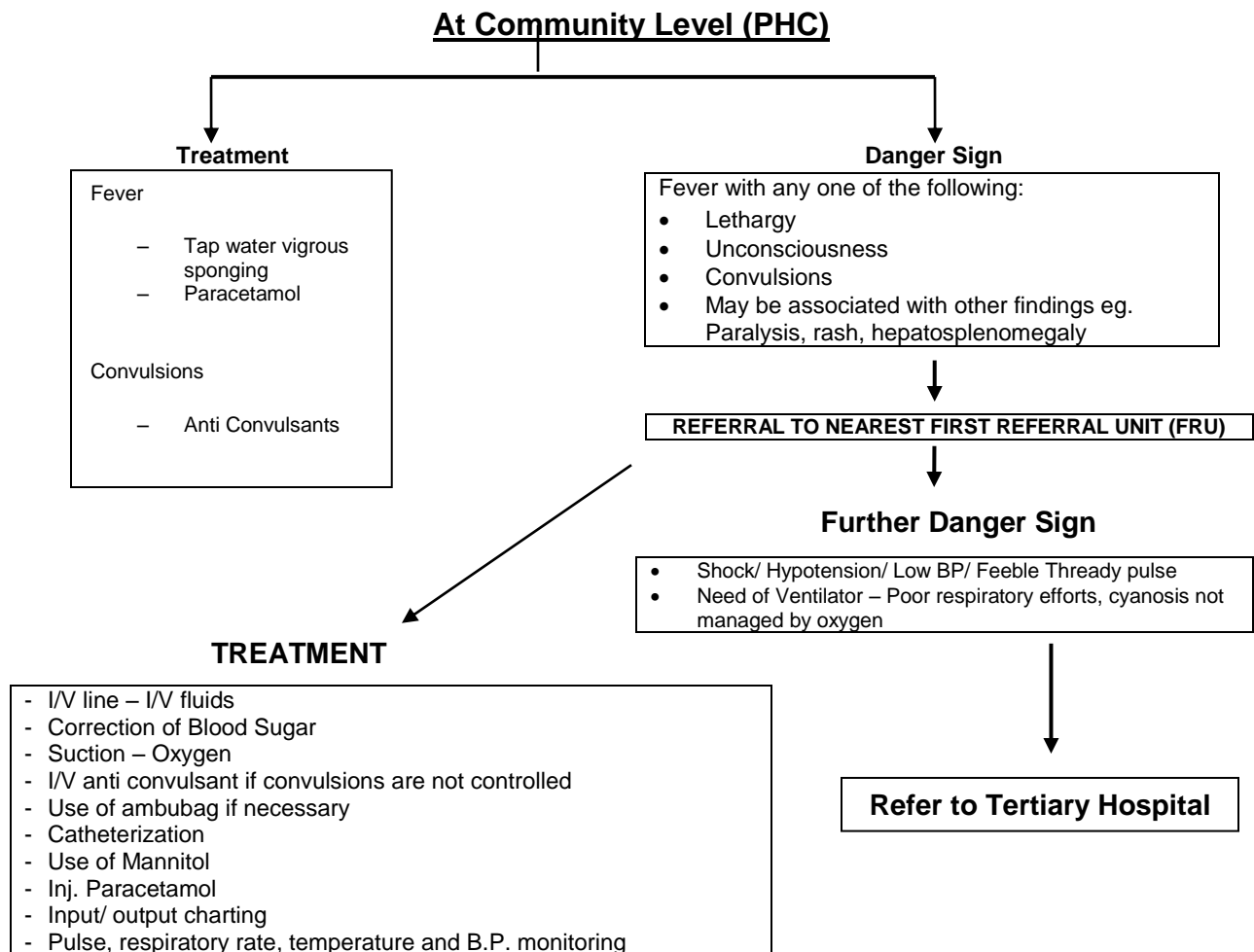
MANAGEMENT OF ACUTE ENCEPHALITIS SYNDROME (AES) INCLUDING JAPANESE ENCEPHALITIS

One of the major components of the Programme Strategy is the case Management of the patients, most of whom are admitted in Health Institutions in a serious condition. This necessitated NVBDCP to design guidelines on Case Management of Japanese Encephalitis in 2007 which can be accessed on the website. The evidence of circulation of entero-viruses in the community in Eastern UP was established by ICMR which prompted revision of above guidelines by incorporating the case management of other Encephalitis including JE. This revision was done in 2009 and the detailed guidelines are as follows:-

Danger Sign & Line of Treatment

Management of Acute Encephalitis Syndrome including Japanese Encephalitis is essentially symptomatic. To reduce severe morbidity and mortality, it is important to identify early warning signs and refer patients to health facility and educate the health workers about the first line if management at the grassroots level. Chart 1 depicts what is to be done for a patient at the community level.

Chart : Management of AES including Japanese Encephalitis



MANAGEMENT OF CASES OF AES INCLUDING JE

Treatment at the health facility, it is important to exclude other causes of CNS affliction like meningitis or cerebral malaria which require specific treatment. Treatment will depend on the condition in which patient is received in the health facility. Since patients are likely to arrive with high grade fever and change in mental status or convulsions proceed with the assessment of patency of airway.

The treatment at PHC/ CHC District level or at tertiary care hospitals remains the same. Depending upon the needs of care and availability of facilities available at the centre/ hospital the patients to be transferred to the nearest higher centre for further management. It should be ensured before transferring the case, all the available treatment is provided to the patient. Only needy patients where such facilities are not available, to be transported. The time consumed in transportation itself is a major cause of high mortality rate.

In all endemic areas, all the facilities including training can be arranged before hand except Ventilatory Support. All Centres should be equipped with ambu beg and oxygen in addition to other medicines and I/V cannula.

The treatment of the patients may require, as follow:-

- 1.) Management of Airways and Breathing.
- 2.) Management of Circulation.
- 3.) Control of Convulsion and Intracranial pressure
- 4.) Control of Temperature
- 5.) Fluid and Electrolytes and Calories/ Nutrition
- 6.) General management
- 7.) Specific treatment of any for treatable cause
- 8.) Investigations, Samples Collection & Transportation
- 9.) Reporting of a case
- 10.) Rehabilitation

MANAGEMENT OF AIRWAY AND BREATHING

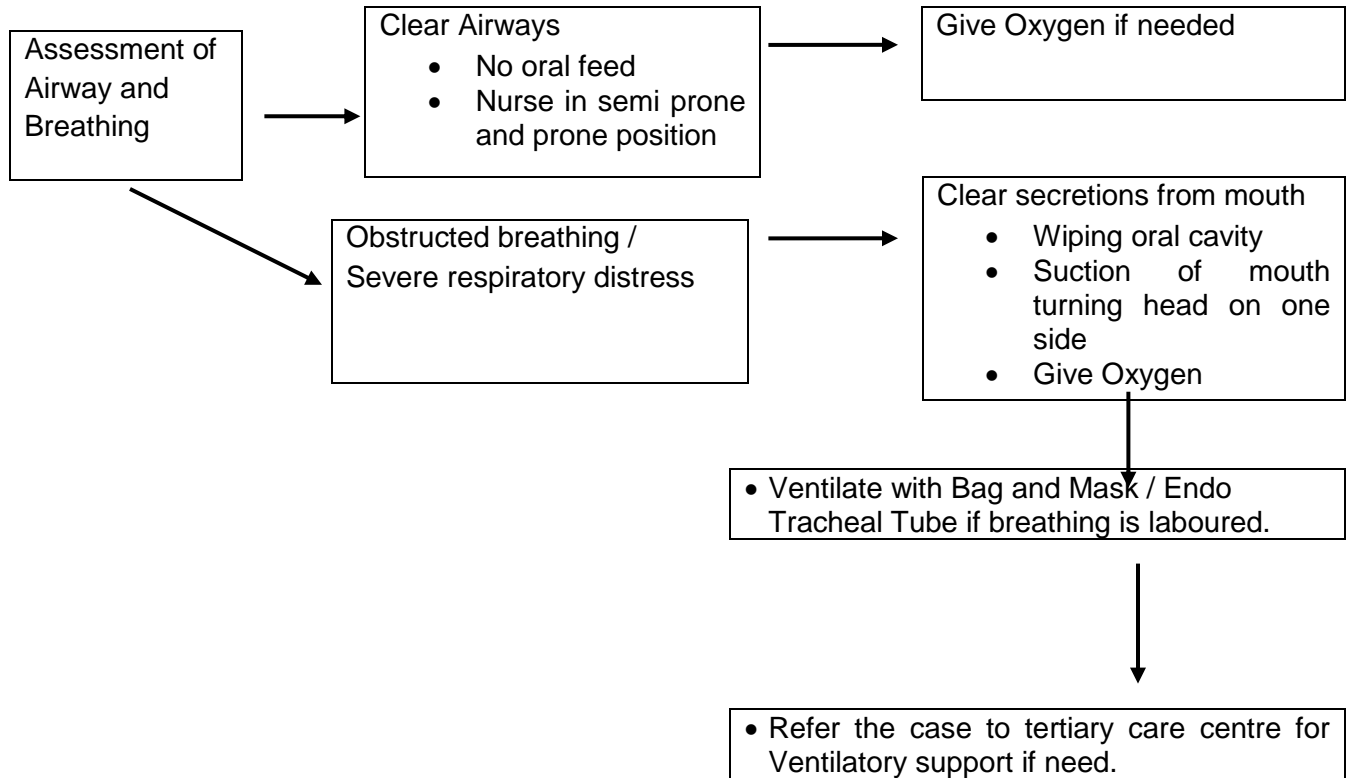
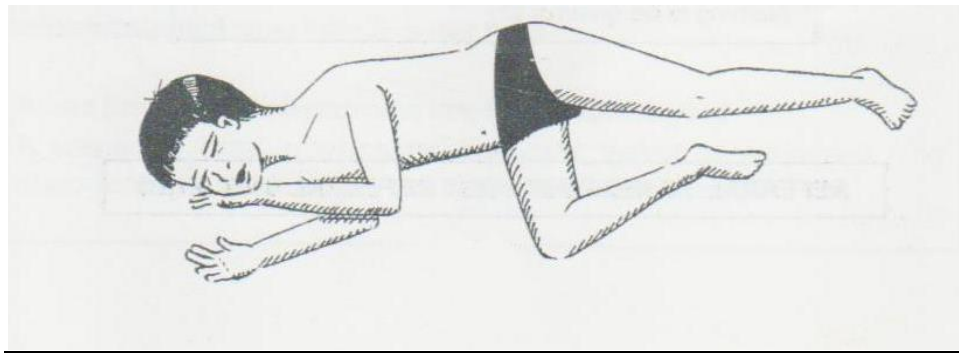


Fig 1. Position of the Patient

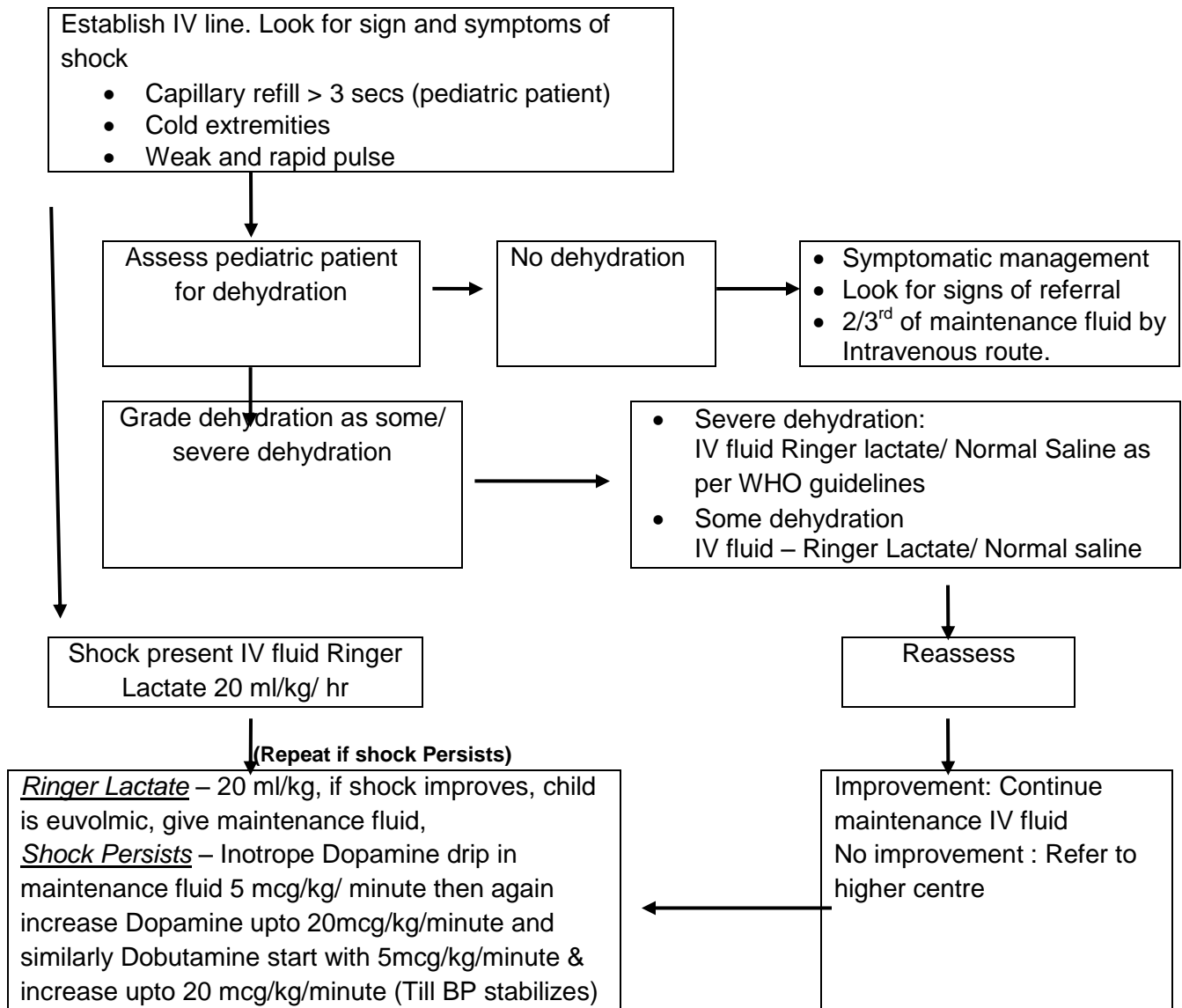
- Turn the patient on the prone side to reduce risk of aspiration.
- Keep the neck slightly extended and stabilize by placing cheek on one hand.
- Bend one leg to stabilize the body position.



Indications of Ventilatory Support

1. Deteriorating General Condition
2. Very Shallow Respiration/ Severe Respiratory Distress/ Heart Sound are Feeble
3. Capillary Refilling time/ colour of Patient Not Improved
4. Dusky Colour of body/ Cyanosis
5. Needs continuous Bag and Mask (Ambu) respiration
6. ABG Parameters

MANAGEMENT OF CIRCULATION



NB : These are broad guidelines; ultimate decision regarding management will depend upon the attending physician.

MANAGEMENT OF CONVULSIONS & I.C.T.

Give anti convulsants if there was a history of convulsions and not given earlier, or convulsions are present. Number one to three are first drug of choice, if convulsions are not controlled.

Anti Convulsants

Sl. No.	Name of Drugs	Doses	Available as	Route of Administration	Indication	Limitation/ Side Effects
1.	Phenobarbitone (Gardinal/Luminal)	20-40mg/kg As loading dose	200mg per ml. ampule	I/V Slowly after dilution in normal saline	Convulsion in infants can be used in all age groups	Good drug controlling seizure & long term use.
2.	Phenytoin (Eptoin/Dilantin)	15-20mg/kg	100mg/2ml amp.	I/V Slowly after dilution in normal saline	Convulsion in all age all groups	Good drug for control of seizure & as maintenance
3.	Sod. Valporate	20-40 mg/kg	I/V Oral Syrup	Syrup can be given as per rectal	All age group	-do-
4.	Diazepam	0.1-0.3mg/kg	I/V or P/R	<ul style="list-style-type: none"> I/V slowly Syrup Suppository P\R 	Uncontrolled Convulsions	May cause respiratory arrest in newborns & infants. Short acting
5.	Lorazepam	0.05-0.1mg/kg oral,	I/V	I/V Slowly	Uncontrolled Convulsion Safe in infants	Tachy cardea, depression Confusion blurred vision
6.	Midazolam	0.2mg/kg	1mg/5kg	S/C, intra nasal safe in injections	Uncontrolled convulsion in infants	Short acting
7.	Inj. Paraldehyde 11%	0.1-0.2mcg/kg deep gluteal can be replaced after ½-hrs.				

Maintenance Dose

- Phenobarbitone 3-8mg/kg/day I/V or oral
- Phenytoin 5-8 mg/kg/day I/V or oral
- Sodium Valproate 40-60mg/kg/day Oral

MANAGEMENT OF INCREASED INTRACRANIAL PRESSURE (Only after correction of Dehydration)

- i. Mannitol 20% I/V – 5 ml/kg in ½ hrs as 1st dose than 2.5 ml/kg at 6 hrs. intervals upto 48 hours (8 doses).
- ii. Injection Lasix I/V – 1 mg /kg upto 40 mg can be given.
- iii. Glycerol solution:- Oral – 0.5 ml/kg mix with fruit juice can be given by nasogastric tube – 3 times a day
- iv. Steroids – are not indicated in viral encephalitis including JE.

CONTROL OF TEMPERATURE

a) If No Rigors:-

- i. Tap Water Sponging: Not only on forehead, palms or soles, whole body to be wet with water and fan(ceiling/table/manual) is on. Cold sponging is harmful.
- ii. If temperature is too high – Cold Sponges may be kept on head, axilla and groins.
- iii. Injection Paracetamol: 5mg/kg, deep intra muscular at either lateral side of thigh or upper outer Quadrant of hip. If injection is not available give Paracetamol 10-15mg/kg maximum upto 600 mg by Nasogastric tube. Paracetamol Suppository are also available which may be used. Other antipyretic medicines e.g. nemusulide/ brufen/ meftal/ aspirin etc are not advisable, specially in children.

b) If chills or Rigors present :

- i. Don't cover patients
- ii. Don't do water sponging
- iii. Use Paracetamol injection, syrup, through nasogastric tube or Paracetamol suppository as advised above.

MANAGEMENT OF FLUID ELECTROLYTES AND CALORIES/NUTRITION

(A) Assessment of Dehydration

Dehydration is classified into No/ some/ Severe Dehydration. Since it is difficult to assess dehydration in a patient of encephalitis as the patient is lethargic and unable to drink, therefore, skin turgor takes precedence over other signs. An objective way of classification would be as follows:

(i) Some Dehydration:

- Irritability
- Thirsty
- Sunken Eyes
- Less Tears
- Dry Mouth
- Skin Turgor Delay

(ii) Severe Dehydration:

- Floppiness
- Drowsiness/ Lethargy
- Unconscious
- Inability to Drink

(iii) Signs of shock

- Oliguria/ anuria
- Rapid and thready pulse
- Capillary filling time > 3secs
- Low Blood Pressure

(B) Management of Dehydration:

(a) Some Dehydration:

- IV fluid Ringer lactate/ N saline 100m/kg to be given over 8 hrs.
- Where the facility for IV fluids is not available administer ORS 75m/kg in 4 hrs through nasogasrtic tube
- Reassess: if there is improvement continue with maintenance IV fluid/if no improvement is detected, switch to plan for severe dehydration

(b) Severe Dehydration

- IV fluid Ringer lactate 100ml/kg is given as per the table below Table 1:

Rate of Fluid (Ringer Lactate)	30ml/kg	70ml/kg
< 1yr	2 hrs	4 hrs
>1yr	1 hrs	5 hrs

- Reassess: If there is improvement switch to maintenance/ if no improvement is detected or deterioration is observed infuse IV fluid more rapidly.

(b) Maintenance

Maintenance fluid is administered at the following rate Table 2:

Weight	Fluid Volume
1 – 10	10 ml / kg
11 – 20	1000 ml + 50cc/kg over & above 10 kg
21 – 40	1500 ml+20cc/kg over & above 10 kg

(C) Calories/ Nutrition

During CNS infections and convulsion and hyperphyrexia state, calories specially glucose required is increased and it should be given in form of 10% Dextrose or even 25% Dextrose may be given on arrival of the patient. A total dose of 200 mg/kg may be

given. All I/V fluids with Dextrose should be continued till patient is stabilized, convulsions are controlled, no vomiting and distention of abdomen, at this time, intra gastric feeding may added and slowly I/V fluids are replaced by total nasogastric feeding.

GENERAL MANAGEMENT

- i. **Suction :** Frequent suction either by mucous sucker, or suction machine to be done on an unconscious patient, so secretion may not collect in mouth to avoid aspiration and maintenance the patency of airways.
- ii. **Nasogastric Aspiration :** Nil orally, place a Nasogastric/ Ryles tube into stomach and do a frequent suction to avoid any vomiting and aspiration. It will also help in decompensation of stomach and decrease intra abdominal pressure. It will help in respiration.
- iii. **Care of Eye, Bowel Bladder & Back :**
 - Eyes to be covered by wet gauge
 - An antibiotic Eye ointment may be applied twice a day or liquid paraffin may be put in eyes to avoid drying of Cornea.
 - If child does not pass stool, put a glycerine enema.
 - Bed should be well maintained, don't allow to form any bed sore. Spirit & powder may be applied on back and on all pressure points.
 - Frequent changing of patient's position.
 - Catheterize the patient to avoid soiling of beds.
 - Physiotherapy once patient is stabilized
 - Other General Nursing Care
 - Treat Secondary infections – by appropriate antibiotics
 - Treat underlying other pathology – e .g. anemia, malnutrition, etc.

TREATMENT OF SPECIFIC CAUSE IF ANY

- i. **Herpes -** Acyclovir – 10 mg/kg/dose, slowly over a period of one hour – 8 hourly X 21 days.
- ii. **Zoster Varicella -** Acyclovir – 10mg/kg/dose, 1/2hrs slowly, over a period of 1 hour – 8 hourly X 2-3 weeks.
- iii. **Malaria -** I/V Quinine – 20 mg/kg in 5% Dextrose slowly over a period of 1hr then 10mg/kg 8 hourly. Monitor Blood Sugar and Blood Pressure.
- iv. **Meningitis (Pyogenic) -**
Start with inj. Ampicillin 400 mg kg 6 hourly upto 12gm/day+
Inj. Ceftriaxone 100-150mg/kg as stat dose than in two dived doses 12 hourly+
Steroid Change antibiotics according to C/S report and response.

- v. **TBM** - Anti Tubercular Drugs (1NH, PZA, Rcin + Ethambutol + Steroids)
- vi. **Toxoplasmosis** - Pyrimethamine 2mg/kg/24 hours in two divided doses X 2 days than 1mg/kg/ on alternate day.
- vii. **Amoebiasis** - Metronidazole – 10mg/kg I/V slowly 8 hourly X 10-14 days.
- viii. **Fungal Infection** - Inj. Amphotericin – B 5mg/kg/24 hours or Fluconazole – oral 200-400mg/kg for 3-6 months.
- ix. **Neurocysticercosis** - Albendazole oral 10/mg/kg(upto 400 mg)/day X 2 weeks.

REHABILITATION

- Physiotherapy/ PMR
- Advice of Pediatric Neurologist
- Correction to fix deformity – by Orthopaedic Surgeon
- Child Psychologist advice
- Various prosthesis
- Artificial appliances

REPORTING OF A CASE

It is very important to report all the suspected cases of AES or JE to the appropriate health authorities to prevent further spread of disease. It should be reported promptly in prescribe proforma. The details should be filled in clear and neat writing and all the information in the proforma should be provided.

CLINICAL DIFFERENTIATION OF JE FROM OTHER VIRAL/BACTERIAL/ PARASITIC INFECTIONS

JE primarily involves the gray matter of many parts of the Central Nervous System. Differentiation of Encephalitis and Encephalopathy and making a probable etiological diagnosis of Japanese Encephalitis and Epidemic Brain Attack in rural areas, (where facilities are minimum but expectations are maximum), on clinical grounds is extremely important to manage the encephalitis case not only as an individual but also for the community since the management of JE and EBA call for immediate reporting to the Health Authorities for a wider coordinated intervention by many different departments to contain the epidemic. Epidemics of Viral Encephalitis demand a clinical diagnosis about the causative Virus for controlling the epidemic at the earliest and for asking for the specific test.

Simple clinical observations help in assessing the depth of coma, planning emergency measures necessary to save the child, limit disability, prognosticate and to initiate epidemic control measures. This must be followed by neurological examination for any localizing signs and to plan for the urgent investigations for a final diagnosis.

Exclusion of treatable conditions like Cerebral malaria, Epidemic Brain Attack, Meningoencephalitis, Herpes simplex virus encephalitis, Varicella / Zoster encephalitis, Metabolic causes of encephalopathy, Tuberculous Meningitis is extremely important since they require prompt additional specific treatment.

The therapy for JE/Epidemic Brain Attack is primarily conservative and supportive since there is no specific treatment for both Japanese Encephalitis and Epidemic Brain Attack, and both have a high case fatality rate, if prompt medical and nursing care is not provided.

Analysis of fatal cases of JE/Epidemic Brain Attack revealed that ignorance is killing more children than the pathogen per se. Only 1 death out of every 35 deaths is directly due to JEV and all others are preventable with prompt and early management bringing down the USUALLY REPORTED case fatality rate of JE from 35-50% to less than 1%. Similar degree of lowering of morbidity is also possible. Same is the case with Epidemic Brain Attack also.

The prognosis of JE depends on the extent of involvement at primary presentation, timely management and autoimmune mechanisms of this disease.

Japanese Encephalitis Case Definition:

Suspected case for referral to Hospital:-

- i. *Fever*
- ii. *Altered Sensorium*

Viral Encephalitis Syndromic Surveillance: *Suspected JE*

Primary Criteria:

- i. Epidemic season
- ii. Acute Fever
- iii. Altered Sensorium lasting > 6 hours
- iv. No rash¹
- v. No evidence of any other encephalitis

Supportive Criteria

- i. Focal Neurologic S/S
- ii. Endemic areas
- iii. JE Season
- iv. CSF consistent with Viral Encephalitis
- v. Normal metabolic Profile

Probable JE

- Encephalitis syndrome
- CSF consistent with Viral Encephalitis
- Elevated IgM antibody
- Stable antibody

Confirmed Case:

- *Suspected case plus*
- *Any one or more of the following*
 - *JE IgM in CSF*
 - *Or 4 fold or greater rise of antibody titers in paired sera (acute / convalescent)*
 - *Or detection of virus, antigen or genome in tissue, blood or other body fluids.*

Management in Tertiary Level Hospitals

- i. Hypoxia is alleviated by intubation, positive pressure ventilation, and ensuring an arterial Pao₂ of 65 mm Hg or better.
- ii. Hypotension is treated in a stepwise fashion by first volume infusion with isotonic fluids to normovolemia, next vasopressors and finally treatment is directed at reducing ICP in an effort to maintain CPP greater than 50.
- iii. Brainstem involvement may necessitate intubation & mechanical ventilation.
- iv. Cardiac arrest requires resuscitation measures.
- v. SIADH (Syndrome of Inappropriate Anti Diuretic Hormone) is treated with Hypertonic saline.

Role of Immunoglobulins in Case Management of AES cases:

The experts are of the opinion that IV immunoglobulin cannot be recommended for routine use in AES cases including JE in view of the current scientific evidence.

List of required equipments and drugs at various levels are enclosed at **Annexure-1**.

List of required equipments and drugs at various levels**1 Essential equipment at the PHC level:**

Air way Sizes "0" and "1",
Mucus sucker,
Rubber feeding tube of various sizes
5 ml & 2 ml Syringes with needles
Thermometer,
Adhesive tape
Enema set
Oxygen

2 Essential Drugs at the PHC level:

Syrup / Injection Paracetamol,
Diazepam rectal solution/ Syp. Diazepam/ Inj. Diazepam/Diazepam Suppository.
Suspension Valproate,
Glucose powder
Tab/Inj Frusemide
Inj Paraldehyde
I/V fluids

3 Essential equipment at the CHC level Hospital:

Air way Sizes "0" and "1",
Mucus Sucker,
Rubber feeding tube size 14,
5 ml Syringe,
Thermometer,
Adhesive tape,
IV cannula, 22 to 24 ,
Ambu Bag,
Foley's Catheters of various sizes
Lumbar Puncture sets
Provision for Cerebrospinal fluid analysis
Enema set

4 Essential Drugs at the CHC level Hospital:

Syrup Paracetamol,
Rectal solution or Syrup Diazepam,
Suspension Valproate,
Syrup Chloral hydrate,
Inj Diazepam,
Inj Phenytoin,
IV fluids N/2, N/5 with 5 % Dextrose, 10% Dextrose, Hypertonic saline,
Normal saline,
Inj Dexamethasone,
Inj Mannitol 20 %,
Inj Frusemide,
Oral Glycerol

Inj Dopamine
Inj Phenobarbitone.
Vitamins
Syrup / Tab Haloperidol
Syrup Chloral Hydrate
Inj Paraldehyde
Inj. Ampicillin
Inj. Chloramphenicol.
Inj Ceftriaxone.