



Japanese Encephalitis with Global Aphasia- A Case Report

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Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

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Case Study

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ABSTRACT

Introduction: Japanese Encephalitis (JE) is a brain infection caused by the Japanese Virus of Encephalitis (JEV). JE is also known as Mosquito-Borne Encephalitis, Summer Encephalitis and Brain Fever etc. Global aphasia is caused by a number of factors, one of which is JE.

Presentation of Case: A 15 years old male child was brought to Acharya Vinoba Bhave Rural Hospital, Sawangi (Meghe), Wardha, Maharashtra, India on date 22/08/2019 with complaints of fever since 7 days with 2 episodes of seizures with loss of consciousness for approximately 20 hours and the patient was unable to speak after becoming conscious. On examination, the patient had a fever, was lethargic and appeared depressed, unable to speak, and experienced pain when moving his hands. The patient had a complete blood count, which revealed that his haemoglobin percent, total red blood count, were all low, while his RDW and granulocytes were high. RBCs are predominantly normocytic Normochromic RBCs with mild anisopoikilocytosis, with a few microcytic RBCs, pencil cells, and tear drop cells visible on a peripheral smear as well as platelets were adequate, and no Hemiparasite was found. CSF analysis, CT scan of the brain, an MRI of the brain, and a blood test for P. Falciparum were all performed for diagnostic purposes. The patient was diagnosed as Japanese Encephalitis with Global Aphasia after comprehensive examinations.

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He was treated Tab. Cefexime, Tab. Levetiracetam, Tab. Phenytoin, Tab. Paracetamol, and Tab. Emset, as well as nursing care was provided based on his needs.

Conclusion: Patient showed spontaneous recovery.

Keywords: Encephalitis; Japanese encephalitis; global aphasia.

1. INTRODUCTION

Encephalitis is inflammation of brain tissues [1]. It may develop due to direct infection or via a hematogenous route. Japanese Encephalitis (JE) is an acute viral disease transmitted by Culex species of mosquitoes [2] and represents severe disease in children with high mortality. Japanese Encephalitis (JE) causes a brain inflammation that is caused by the Japanese Encephalitis Virus (JEV) [3]. In Asia, the Japanese Encephalitis Virus is the most common cause of viral encephalitis [4]. It is a member of the Flavivirus family, which includes dengue, yellow fever, and West Nile viruses [4]. JE is also known as Mosquito-Borne Encephalitis, Summer Encephalitis, Brain Fever, Japanese Encephalitis, Arbovirus B, Russian Autumnal Encephalitis. JE has a 4 to the 14-day incubation period [4]. The Japanese Encephalitis Virus is one of the most serious public health issues, because of the high number of deaths and severe neuropsychiatric consequences, lifelong care is necessary that posing a significant socioeconomic burden [5].

Aphasia is language dysfunction that may involve impaired comprehension or expression of words or nonverbal equivalents of words. It results from dysfunction of the language centers in the cerebral cortex and basal ganglia or of the white matter pathways that connect them [6]. Damage to the language processing centers in the left hemisphere of your brain, including Wernicke's and Broca's areas, can cause global aphasia [7]. Diagnosis is clinical, often including neuropsychologic testing, with brain imaging (CT, MRI) to identify cause. There is no specific treatment, but speech therapy may promote recovery [6]. Prognosis depends on the cause and extent of damage and on patient age [6].

JE manifests itself in a variety of ways, but the most common symptoms are sudden fever, headache, vomiting, cognitive impairment, and disturbance of consciousness, which may be accompanied by epilepsy, Parkinson's disease, and other symptoms; in severe cases, respiratory failure may develop [6].

Epidemiology: Japanese Encephalitis is one of the major child health issues in India and epidemics has been recorded in many areas since 1955 [8]. The Geographical distribution of JE: Endemic to temperature and Asia's tropical zone, endemic to India. Boys are more often affected, perhaps due to dressing and playing habits, than girls [9]. JE is the only virus so far confirmed to cause epidemics of encephalitis in India and other viruses cause sporadic cases. JE has high mortality (20-50%) and morbidity rates (0.3-1.5/10000 population). The usually affected age group is 5-10 years though children from 1-15 years can also be afflicted. Adults may be affected either due to fresh introduction of virus (as in West Bengal) or vaccination of pediatric population [9]. Birds migrating from endemic nations, wind-blown mosquitoes, pig farming in rice fields, climatic change, stagnant water, and the introduction of animals from JEV-infected areas are all risk factors for JEV transmission [10].

- **JE endemic areas in India:** Andhra Pradesh, Assam, Bihar, Haryana, Kerala, Karnataka, Maharashtra, Manipur, Nagaland, Tamil Nadu, Uttar Pradesh and West Bengal.
- **The reservoir of Japanese Encephalitis:** The most important biological amplifier and reservoirs are pig, Ardie birds and water-birds herons and egrets [9].
- **Transmission of JE:** JE virus is transmitted to humans through the bite of infected Culex species mosquitoes, particularly Culex tritaeniorhynchus. JE virus transmission occurs primarily in rural agricultural areas, often associated with rice production and flooding irrigation.

2. CASE PRESENTATION

A 15 years old male child was brought to Acharya Vinoba Bhave Rural Hospital, Sawangi (Meghe), Wardha, Maharashtra, India on date 22/08/2019. The presenting complaints of the patient were fever for 7 days with 2 episodes of seizures with loss of consciousness for approximately 20 hours on the date 22/08/2019 and after becoming conscious the patient was not able to talk.

Table 1. Showing investigations of the patient

Complete Blood Count	Hemoglobin was 11.3% (anemia) Total Red Blood Count was 4.05 million/cu.mm Total White Blood Cell Count was 10900/cu.mm Haematocrit (HCT) was 35.7% Mean Corpuscular Volume was 88 cub. micron, Mean Corpuscular Hemoglobin was 29.5 Pico gm, Mean Corpuscular Hemoglobin Concentration was 33.5%. Total Platelet Count was 2.08 lac/cu.mm, RDW was 17.5%, Monocytes was 01% , lymphocytes was 27%, eosinophils was 02%, granulocytes was 70% and basophils was 00%.
Peripheral Smear	RBCs was predominantly Normocytic Normochromic with mild anisopoikilocytosis showing few microcytic RBCs, few pencil cells and tear drop cells. Platelets: adequate on smear. APC: 74,000 cells/mm ³ as per cell counter. No Haemoparasite.
Coagulation profile	APTT- control: 30 APTT- patient: 31.5
Kidney Function Test (KFT)	Urea was 19 mg/dl (10-50 mg/dl) creatinine was 0.4 mg/dl (0.6-1.1 mg/dl) Sodium was 137 Potassium was 3.8
Liver Function Test (LFT)	Alkaline Phosphate was 79 IU/L (39-117 IU/L) Total bilirubin was 0.8 mg/dl (1.1 mg/dl) SGOT was 41 IU/L (up to 37 IU/L) SGPT was 22 IU/L (up to 40 IU/L) Total Protein was 7.1 g/dl (6.6- 8.7) g/dl Albumin was 3.3 g/dl (3.8-5.1g/dl), Globulin was 3.8mg/dl
Urine Analysis	Urine albumin: Traces Urine sugar: Nil Pus Cells: 1-2 cells/hpf
Virology investigation	HIV Test: Non-Reactive HCV Test: Non-Reactive HBS Ag: Non-Reactive
Cerebrospinal Fluid (CSF) analysis	CSF analysis done for detection of IgM antibodies.
Blood test for P. Falciparum Blood Culture	Blood test for P. Falciparum was Negative. No growth was found after 48 hours of incubation.
MRI Brain Scan	MRI Brain Scan was revealed sign of acute necrotising encephalitis possibly Japanese Encephalitis or chance of Cerebral Malaria
CT scan	CT scan was revealed sign hypodensity involving deep cerebral white matter and sign of SAH with cerebral malaria.

On physical examination the patient had a fever, inactive and looks depressed, headache, restlessness and patient was irritable and had episodes of vomiting, unable to talk, pain while doing movements of hands as well an IV cannula was present on the right side of the hand.

On neurological assessment, Glasgow coma scale score: 12 where, Eye opening response was 5, Verbal response was 1 and Motor response was 6. The deep tendon reflex was 2+ and plantar flexors were present. The power was not electable. The patient had negative Babinski sign.

Table 2. Treatment

Sr. No.	Name of the drug	Dose	Route	Frequency	Drug Action
1.	Tablet Cefexime	250 mg	Oral	Twice a day	Antibiotics
2.	Tab. Phenytoin	300 mg	Oral	Twice a day	Anticonvulsant
3.	Tablet Paracetamol	500 mg	Oral	If necessary	Antipyretic
4.	Tablet Emset	40 mg	Oral	Once daily	Antiemetic
5.	Tablet Levetiracetam	500 mg	Oral	Twice a day	Anticonvulsant
6.	Intravenous Fluid		Intravenous		To maintain fluid and electrolyte balance
7.	Injection Multivitamin in 500 ml Normal Saline	10 ml	Intravenous		For prevention of vitamin deficiency

2.1 Diagnostic Assessment

Treatment was started immediately after admission.

3. MANAGEMENT

For patients with Japanese encephalitis, there is no specific treatment and no specific antiviral therapy [9]. The supportive treatment is given to the patient to relieve symptoms and stabilize the patient.

3.1 Management of Aphasia

Although there is no specific treatment for global aphasia, speech therapy may help. The prognosis is determined by the cause and extent of the damage, as well as the patient's age [6]. In our case, speech therapy was given to patient and it help him to speak some words.

3.2 Physiotherapy

In our case, physiotherapy is provided to patient to improve strength, flexibility, motor coordination, mobility and balance.

3.3 Therapeutic Intervention

General measures to check the vital sign (Temperature, Pulse, Respiration and Blood Pressure), to check the patency of the airway, to maintain fluid and electrolyte balance, to prevent infection and prevent complications like a shock, cardiopulmonary disorder, epilepsy, paralysis, cerebellar ataxia, mental retardation, obesity and behavioural problem. Health management includes medication administration, rest and a healthy diet.

3.4 Prognosis

The prognosis for an encephalitis child depends on the age of the child, the type of organism and the type of residual neurological damage [5]. There may be elevated neurological disabilities in very young children under 2 years of age, including intellectual disabilities and epilepsy as well the follow-up care with periodic re-evaluation is important because symptoms are obtained subtle and rehabilitation is essential for a patient who develops residual effects of the disease [5]. In our case the patient showed spontaneous recovery without any complications.

3.5 Prevention and Control of Japanese Encephalitis

As there is no cure Japanese encephalitis prevention is mainly focused on two measures, i.e., management of mosquitoes and immunization against JE [11] i.e. human vaccination to populations at-risk is the only effective long-term control measure [12].

4. DISCUSSION

Japanese Encephalitis (JE) is a brain infection caused by the Japanese Encephalitis Virus (JEV) [3]. JE is Endemic in temperate and tropical region of Asia, In India it is endemics. Our case was from Village: Vyad, District Wasim, State: Maharashtra, India. The epidemics coincide with the monsoon and post monsoon period (August to December) [9]. In our case, the patient had admitted on August, date 22/08/2019. The clinical manifestations depend upon three variables, namely, severity of infection, susceptibility of the host and location of the agent. Clinical manifestations of focal brain damage due to

infection are seen during the acute encephalitis stage which lasts 3-4 days. One or more focal/asymmetric symptoms/signs, appearing in the first few days, are the telltale signs of encephalitis in the clinical setting. These include seizures and/or other abnormal movements (tremors, ballismus, chorea, athetosis), stereotyped movements like cycling, pedalling, abnormal posture of limbs (dystonia), asymmetrical spontaneous eye movements or Doll's eye movements (DEM), cranial nerve palsies, reflex asymmetry, weakness of one or more limbs, loss of consciousness, decorticate or decerebrate rigidity and irregular respiration [9]. In our case, the patient had a fever, inactive and looks depressed, headache, restlessness irritable and had episodes of vomiting, loss of consciousness with unable to talk, pain while doing movements of hands as well as one episode of seizure with frothing from mouth with up rolling of eyes were present. The deep tendon reflex was 2+ and plantar flexors were present. The power was not electable. The patient had negative Babinski sign.

The diagnostic evaluation of JE was done with the help of detect virus-specific IgM antibodies by analysing serum or cerebrospinal fluid. Craniocerebral MRI and CSF examination are of great significance for early diagnosis [13]. In our case CSF analysis was done for detection of IgM, CT scan and MRI scan were done for the clinical diagnosis.

The treatment - is mainly supportive because there is no specific antiviral treatment for a patient with JE [9,12]. In our case, the symptomatic and supportive treatment was given to a patient that helped the patient to prevent from complications as well as to prevent morbidity and mortality of child.

4.1 Nursing Diagnosis

Altered body temperature related to the disease condition, ineffective Cerebral Tissue Perfusion related to the disease condition, risk for injury related to seizures and weakness, imbalanced nutritional pattern is less than body requirements related to anorexia, nausea and vomiting and knowledge deficit related to the family's understanding of the patient's condition.

4.2 Nursing Management

per the criteria, nursing care was given to maintain the health status and to prevent further

complications. For these, vital signs were recorded strictly. Monitor Blood Pressure and monitored, Oxygen Saturation of the patient; provide a comfortable position to the patient, assisted in doing daily activity of life of the patient, monitored intake and output, administered all the prescribed medication. The overall response to treatment of the patient was positive and patient condition improved progressively. The excellent nursing care and the patient guardian reported to the nursing staff. Complete discharge procedure was explained by nursing staff to the patient's and patients cousin brother as patient was live with his family along with medication prescribed at home as advised by the paediatrician as well as health education is given to the guardian of the patient regarding disease condition, prevention, medication administration, diet and how to take care at home as well as follow up. The patient was discharged from the hospital after 19 days of treatment without any complications.

5. CONCLUSION

JE is fatal to almost one third of affected human population [14]. The main reason for the high morbidity and mortality rates in India is either delay or improper/inadequate nursing care [7].

In this case report the symptomatic and supportive treatment as well as excellent nursing care was provided to the patient such as medications, physiotherapy and speech therapy. With the help of this treatment patients health was improving and he was able to talk some words as well as able to walk and do daily activities.

6. RECOMMENDATIONS

Vaccination against JE is a public health priority. JE vaccination was World Health Organization recommends in immunization schedule in all JE affected areas. The mosquitoes control measures were taken in the affected area as preventive measures. Provide health education and camping via mass media for preventive measures from JE [4].

CONSENT

While preparing case reports for publication guardian informed consent has been taken from patient brother.

ETHICAL APPROVAL

As per international standard or university standard written ethical approval has been collected and preserved by the author(s).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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