The Journal of International Medical Sciences Academy
2025; (April - June); Vol 38; No. 2

CASE REPORT

Complex Encephalitis in a Middle-Aged Male with Systemic Hypertension and West Nile Fever: A Diagnostic and Therapeutic Challenge

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Abstract

This case report details the clinical presentation, diagnostic evaluation, and treatment of a 52-year-old male water authority superintendent with systemic hypertension who developed severe neurological symptoms following a febrile illness. The patient's history of travel to remote areas, night duty shifts, and exposure to a colleague with febrile illness complicated the diagnostic process. The CSF showed characteristics neutrophilic leukocytosis and MRI abnormalities. Despite comprehensive medical intervention, including antimicrobial, antiviral, and supportive therapies, the patient's condition deteriorated, highlighting the challenges in managing complex cases of encephalitis with potential viral etiologies.

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Received: 06th December 2022
Accepted: 10th August 2024

How to Cite this Article: Karadan U, Shridharan P, Thabsheer, Anuja. Complex Encephalitis in a Middle-Aged Male with Systemic Hypertension and West Nile Fever: A Diagnostic and Therapeutic Challenge. J Int Med Sci Acad 2025;38(2):89-90.

Access this article online : www.imsaonline.com

Introduction

Encephalitis, an inflammation of the brain parenchyma, can be caused by various infectious agents, autoimmune processes, and other inflammatory conditions. This report describes a challenging case of encephalitis in a middle-aged male with a background of systemic hypertension, emphasizing the diagnostic and therapeutic complexities encountered [1,2,5].

Case Presentation

A 52-year-old male water authority superintendent, with a known history of systemic hypertension, presented with a three-day history of low-grade fever, rhinitis, and dry cough. His condition escalated to high-grade fever, severe dysphagia, dysarthria, and tremors over the past 24 hours. He had recently traveled to remote areas such as Chokli and Monthal (regions near Mahi) and had night duty shifts over the past two weeks. A colleague had a recent history of fever, vomiting, and diarrhea, initially treated as food poisoning, with residual fatigue.

Clinical Findings

On arrival at the hospital:

- **Glasgow Coma Scale (GCS):** E4V5M6
- **Respiration:** Tachypneic
- **Tremors:** Resting tremors observed
- **Vital Signs:** Stable
- **Neurological Examination:**
  - Facial deviation to the right
  - Pooling of saliva in the mouth
  - Bilaterally absent palatal movement
  - No limb weakness
  - Preserved deep tendon reflexes
- **Other Systems:** Within normal limits

The patient was admitted to the Neuro ICU. Shortly after admission, he developed paradoxical respiration and desaturation, necessitating intubation and mechanical ventilation.

Diagnostic Investigations

- **MRI Brain (with contrast):** Subtle increase in leptomeningeal enhancement in bilateral frontoparietal regions and early bilateral basal ganglia hyperintensities, no exudates.

Repeat MRI - west nile encephalitis showing diffusion restriction in bilateral caudate and putamen

- **MRA and MRV:** Normal
- **CSF Analysis (Day of Admission):**
  - Protein: 94.1 mg/dL
  - Glucose: 149 mg/dL (corresponding RBS: 255 mg/dL)
  - WBC: Elevated with neutrophilic predominance
- **Echocardiogram (ECHO):** New onset regional wall motion abnormalities (RWMA) and severe left ventricular (LV) dysfunction

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- **Troponin I:** 4297 ng/L
- **Other Blood Tests:** CBC, LFT, RFT, serum electrolytes, CPK and blood sugars within normal limits.
- **Tropical Fever Workup:** Negative for Dengue, Scrub typhus, Leptospirosis, and malarial parasites
- **Viral Markers:** Negative for HBsAg, HCV, and HIV

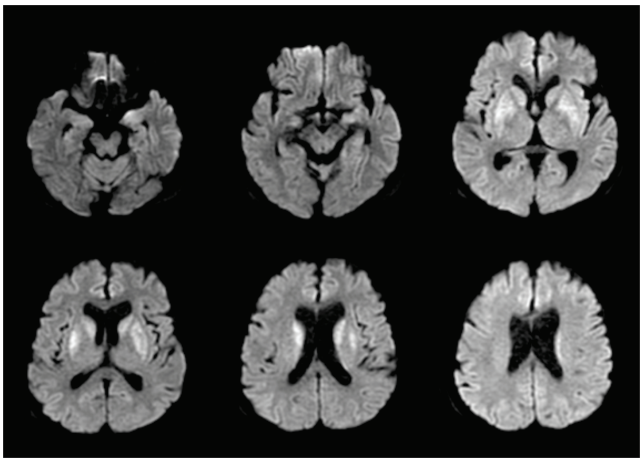

Fig. 1: MRI image of west nile encephalitis showing diffusion restriction in bilateral caudate and putamen

Clinical Course and Management

The patient was initiated on IV antibiotics, IV Acyclovir, and Inj. Methylprednisolone, alongside other supportive measures. Despite treatment, his condition worsened, and he developed generalized tonic-clonic seizures, necessitating the addition of antiepileptic drugs. An EEG revealed evidence of diffuse cerebral dysfunction [3,4].

Further Diagnostic Findings

- **CSF Meningoencephalitis Panel:** Negative (including E. coli, H. influenzae, Listeria, Neisseria, Streptococcus, CMV, Enterovirus, HSV 1 & 2, HHV 6, Varicella Zoster Virus)
- **CSF Autoimmune Encephalitis Panel:** Negative
- **CSF, Blood, and Urine Cultures:** Sterile
- **Serum IgM:** Positive for West Nile fever, mildly positive for Japanese Encephalitis

Treatment Adjustments

Due to the declining GCS (E1VTM1 by day 3 of admission), the patient was started on IVIG infusion. Repeat CSF analysis showed:

- Protein: 48.4 mg/dL
- WBC: Elevated (100 cells/mm³, 100% neutrophils)

The patient received Inj. Minocycline and Ribavirin without improvement in neurological status. Repeat MRI showed hyperintensities in bilateral basal ganglia and thalamus.

Complications

During the ICU stay, the patient developed acute kidney injury, flaccid quadriplegia and bulbar involvement progressing to deep coma, likely due to Ribavirin-induced hemolysis, and was started on hemodialysis following nephrology consultation.

Discussion

This case underscores the diagnostic and therapeutic challenges in managing encephalitis with potential viral etiologies, particularly in patients with complex clinical presentations and pre-existing conditions such as systemic hypertension. The patient's travel history and exposure to remote areas posed additional challenges in identifying the causative pathogen. Despite extensive diagnostic efforts and aggressive treatment, the patient's condition deteriorated, reflecting the severe impact of these infections on the central nervous system.

Conclusion

This report highlights the complexity of diagnosing and treating encephalitis in patients with multifactorial etiologies and pre-existing conditions. Early recognition and comprehensive management are crucial, although outcomes may remain unfavorable despite best efforts. Further research into more effective therapeutic strategies and preventive measures for encephalitis is warranted.

Conflict of Interest:	Author declare no COI
Ethics:	There is no ethical violation as it is based on voluntary anonymous interviews
Funding:	No external funding
Guarantor:	Dr Ummer Karadan, will act as guarantor of this article.

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