https://doi.org/10.33472/AFJBS.6.6.2024.7384-7387

African Journal of Biological Sciences

Journal homepage: http://www.afjbs.com

Research Paper Open Access

Beyond The Bite: A Case Report On Acute Disseminated Encephalo-Myelitis Following Scrub Typhus

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Article Info

Volume 6, Issue 6, July 2024

Received: 31 May 2024

Accepted: 28 June 2024

Published: 22 July 2024

doi: 10.33472/AFJBS.6.6.2024.7384-7387

ABSTRACT:

Acute disseminated encephalomyelitis (ADEM) is a, rare disease of autoimmune origin affecting the neurological system, and is characterized by widespread inflammation and demyelination in the spinal cord and brain. Typically triggered by infections or vaccinations, ADEM predominantly affects children but can occur at any age. Clinically, it presents with rapid onset of multifocal neurological symptoms, including headache, fever, altered mental status, motor deficits, and ataxia. Diagnosis is primarily clinical, supported by magnetic resonance imaging (MRI) which reveals disseminated lesions of white matter. Cerebrospinal fluid (CSF) analysis often reveals pleocytosis and increased protein levels, though these findings are non-specific. The differential diagnosis includes multiple sclerosis (MS), neuromyelitis optica (NMO), and other infectious or inflammatory conditions. Management involves high-dose corticosteroids as first-line treatment, with intravenous immunoglobulin (IVIG) or plasmapheresis reserved for refractory cases. Early diagnosis and treatment are crucial for favorable outcomes, as ADEM generally has a good prognosis with complete or near-complete recovery in most patients. However, a minority may experience recurrent episodes or long-term neurological sequelae. This review provides an outline of the contemporary understanding of ADEM, highlighting the importance of prompt recognition and management to mitigate long-term complications.

Keywords: Scrub Typhus, Acute Disseminated Encephalomyelitis, Plasmapheresis.

1. Introduction

Acute disseminated encephalomyelitis (ADEM) is an uncommon inflammatory demyelinating disorder of the central nervous system, often triggered by infections or vaccinations. It usually presents as neurological symptoms which is multifocal and sudden in onset and is usually associated with preceding infections caused by bacteria and viruses. Scrub typhus, which is an infectious disease is caused by bacterial pathogen, Orientia tsutsugamushi and is spread through the infected chigger bite, is an acute febrile illness prevalent in many parts of Asia.
While scrub typhus primarily presents with fever, rash, and eschar, it can occasionally lead to severe complications such as meningoencephalitis. However, the occurrence of ADEM following scrub typhus infection is exceedingly rare and not well-documented in medical literature. Here, we present a case report of ADEM that developed following a scrub typhus infection, highlighting the clinical presentation, diagnostic challenges, and therapeutic management. This case highlights the significance of including ADEM in differential diagnoses of patients with acute neurological symptoms following scrub typhus and contributes to the growing comprehension of the various neurological sequelae related with this infection.

Case History
A girl of age 6 years was brought with a history of 10 days of fever, generalized weakness in her upper and lower limbs for 7 days, inability to bear weight on her lower limbs for 5 days and loss of bladder control for 3 days and altered sensorium and behavior for 1 day (figure:3). She had no history of loose stools, recent vaccination or any similar episode in past nor any history of prior hospital admission or any significant family history. She was lethargic on admission. Her initial Glasgow Coma Scale (GCS) was E4V3M5, with mild neck rigidity, bilateral plantar extensor response, reduced muscle tone in all four limbs, and grade 1 hyporeflexia in the upper and lower limbs. P/A examination showed hepatosplenomegaly. She was provisionally diagnosed with acute meningoencephalitis syndrome (AMES) and started on cefotaxime.

Her GCS gradually worsened, and she developed a generalized tonic-clonic seizure (GTCS), prompting the addition of levetiracetam. CSF analysis was normal, and CSF culture showed no growth. Scrub typhus IgM was positive and was started on Doxycycline. Tests for Dengue IgM, and Widal were non-reactive. The patient's hemodynamic status gradually improved.EEG showed generalized slowing- s/o encephalopathy (figure: 2). MRI of the brain showed multiple large fluffy poorly demarcated hyper intensities in B/L periventricular and centrum semiovale region with involvement of left cerebellum and upper brainstem with prominent lateral ventricle s/o ADEM or sequelae of meningoencephalitis (figure1).

She was treated with a pulse of intravenous prednisolone, followed by a 6-week course of oral prednisolone. Her neurological status improved gradually. At discharge, she had normal muscle power (5/5) in all limbs, no bladder or bowel abnormalities, normal muscle tone, no focal neurological deficits, normal speech, and had been convulsion-free for more than a week.

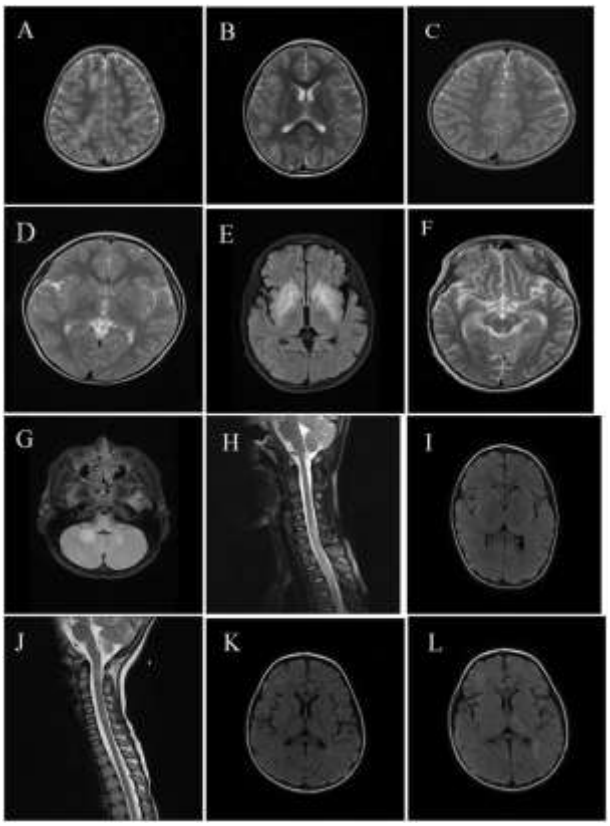

Figure: 1

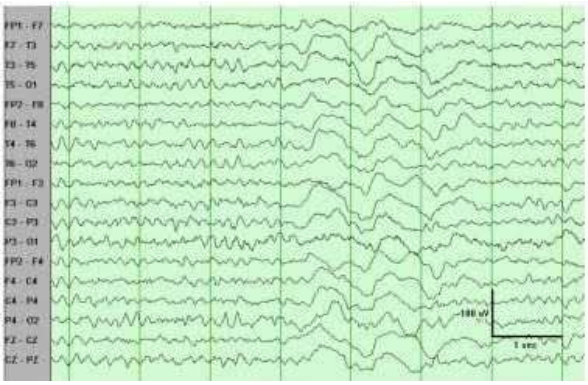

Figure: 2

Figure: 3

2. Discussion

Acute disseminated encephalomyelitis is a , rare disease of autoimmune origin affecting the neurological system, common in childhood(early), presenting with sudden-onset multifocal neurologic deficits, encephalopathy, and MRI evidence of demyelination(3,4). Most cases occur in children aged 5-8, with a slight male predominance. Recurrences after three months are termed multiphasic disseminated encephalomyelitis (MDEM), often associated with MOG antibody positivity (MOGAD).

Symptoms include lethargy, fever, headache, vomiting, seizures, and behavioral changes (1,2). MRI typically shows large, bilateral T2 lesions in the brain, with potential spinal cord involvement. Recovery usually starts within days to weeks, but symptoms may fluctuate, and some residual deficits are common. Treatment involves steroids, with immunoglobulin or plasmapheresis for severe cases (5, 6). Differential diagnoses include multiple sclerosis and other neurological disorders (7).

Infections like influenza, EBV, and COVID-19 often precede ADEM, suggesting an infectious trigger. Most children recover fully, though some may experience cognitive or behavioral changes.

3. Conclusion

This rare occurrence highlights the importance of early recognition and prompt management of such complications to minimize long term neurological sequelae. Further research is warranted to better understand the pathophysiology and optimal treatment strategy for such rare presentations.

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