Case Report

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An Unusual Case Masquerading Tuberculous Meningitis: A Case Report

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Abstract

Background: Scrub typhus is known to cause meningitis in children. Literature on neuroimaging findings in scrub typhus is very scarce. Case characteristics: A case of acute meningoencephalitis with raised intracranial tension demonstrated basal meningeal enhancement and ventricular prominence on CECT brain. In view of clinical non-responsive and CECT findings, antitubercular therapy was started. Subsequently rickettsial serology came out to be positive for Orientia tsutsugamushi; good response was observed to doxycycline. *Outcome:* Dramatic clinical response to doxycycline was observed favoring a diagnosis of scrub typhus meningitis.

Keywords: Scrub typhus; Tuberculous meningitis; Basal meningeal enhancement.

Introduction

Scrub typhus has been known to cause CNS involvement in children and meningitis/ meningoencephalitis occurs in 6 to 14% of affected patients.[1,2] However there is paucity of data on this topic in pediatric age group.

Tuberculous meningitis (TBM) which is highly prevalent in India closely mimics scrub typhus meningitis (STM) in terms of clinical features and CSF analysis.[3] However due to scarcity of literature on neuroimaging findings in rickettsial meningoencephalitis it becomes difficult to differentiate between the two entities. Basal meningeal enhancement and early hydrocephalus on CECT (contrast enhanced computed tomography) brain are are a characteristic finding seen in TBM.

We report an unusual case of aseptic meningitis with basal meningeal enhancement and hydrocephalus on CECT brain which proved to be due to scrub typhus in etiology.

Case Report

A 7-year-old developmentally normal boy presented with complaints of fever with chills for three days and one episode of generalized tonic clonic seizure leading to altered sensorium for last few hours. At admission temperature was 38.9°C. Rest of the vitals were within normal limits. His weight was 20 kg. The child was in altered

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sensorium and neck stiffness was present. Tone was increased in all limbs and deep tendon reflexes were brisk. Cranial nerves were normal on examination. Pupils were normal in size, normally reacting. Conjunctivae were congested. Examination of abdomen revealed a mild hepatosplenomegaly. Investigations revealed a TLC of 24 × $10^3/\mu$L with a predominance of neutrophils (70%) hemoglobin of 111 g/L and platelet count of 90 × 10^9/L. RBS and Serum electrolytes were reported to be in normal range. Hepatic transaminases were raised (SGOT-70 U/L, SGPT-68 U/L). Serum albumin was 35 g/L diagnosis of acute meningoencephalitis was kept and broad spectrum antibiotics; ceftriaxone, vancomycin and antiepileptic drugs were administered. Papilledema was present on fundus examination therefore mannitol and dexamethasone were administered. Investigations like typhidot IgM, malaria card test came out to be negative. On day 2 of admission mild distention of abdomen with billious gastric aspirates was noted. Bowel sounds were present and abdomen was nontender. X-ray abdomen and serum electrolytes were normal. The patient did not pass stool for three days. On day 3 due to persistance of fever, altered sensorium and GIT manifestations meropenem was started in place of ceftriaxone. On day 5, nasogastric aspirates and abdominal distention subsided. Due to persistence of papilledema lumbar puncture was withheld. Blood culture and urine culture showed no growth. The history was reviewed. The child belonged to agricultural background and a single eschar was present in inguinal region. There was no rash. Hence serology for rickettsial diseases was sent. CECT brain was done which revealed a mildly prominent ventricular system with periventricular ooze in bilateral occipital lobes with irregular leptomeningeal enhancement along bilateral tentorium cerebelli and basal cisterns (Fig. 1).

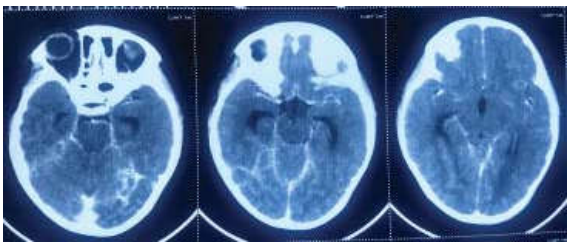

Fig. 1: CECT brain shows a mildly prominent ventricular system (third ventricle) with periventricular ooze in bilateral occipital lobes. There is irregular leptomeningeal enhancement along bilateral tentorium cerebelli and basal cisterns.

Dengue serology and Japanese encephalitis serology came out to be negative. Acetazolamide was started and keeping a possibility of TBM,work up for Koch's was done which came out to be negative. On day 7, the fundus examination showed a resolving papilledema, lumbar puncture was done. Mild pleocytosis (20–25 lymphocytes/mm^3) with raised protein (65 mg/dl), CSF: blood glucose ratio of 0.8, and negative gram and Ziehl-Neelson staining were observed on CSF examination. CSF CBNAAT was also negative. In view of persistent fever and altered sensorium; and CECT findings four drug antitubercular therapy (ATT) was started. After three days IgM ELISA tested positive for Orientia tsutsugamushi, hence oral doxycycline was initiated. Over next 48 to 72, hours fever subsided and sensorium improved dramatically. The papilledema subsided after a couple of days. ATT was continued and doxycycline was given for 10 days. Repeat CECT done after 3 weeks was normal. ATT had been given for a total of 20 days and was omitted. Post-ATT withdrawal the child continued to improve and neurological examination at discharge was normal. His 3 months, 9 months and one year follow-up post-discharge was also uneventful.

Discussion

Rickettsiae are increasingly being recognized as important pathogens causing multisystemic involvement in cases of acute febrile illnesses. Due to low index of suspicion, absence of eschar in a large number and non availability of diagnostic tests many cases are missed. GIT manifestations ranging from vomiting, diarrhea, pain abdomen to acute surgical abdomen can occur in children especially in early part of clinical course.[5] GIT manifestations were present in our case during early course. Normal to low TLC counts in early stages with leukocytosis later on, thrombocytopenia, elevated hepatic transaminases, hypoalbuminemia, hyponatremia are suggestive lab features which point towards rickettsial etiology.[6] Our case also demonstrated thrombocytopenia and elevated hepatic transaminases whereas serum albumin and sodium were in normal range.

CSF analysis in scrub typhus meningitis shows mild to moderate pleocytosis, mildly raised protein, normal CSF: blood glucose ratio.[2,7] We also obtained similar results. Due to our resource limited setting CSF investigations, i.e. PCR for HSV and *M. Tuberculosis* and MRI brain could not be done. We could find very few case reports/studies of STM in children in whom neuroimaging was done. In these CT brain was either normal or non specific showing brain edema.[7,8] Neuroimaging

in adults in such cases shows microhemorrhages, periventricular ooze, infarct in lenticular nucleus and transverse myelitis.[9]

Basal meningeal enhancement and early hydrocephalus on CT favors TBM.[4] Subsequent to ATT initiation IgM ELISA for scrub typhus came out to be positive. Rickettsial and TBM presenting as dual infection causing acute encephalitis syndrome has been reported in adults.[10]

Facing this diagnostic dilemma both doxycycline and ATT were administered initially. Short history, clinical, epidemiological scenario and lab findings pointed to diagnosis of STM. Our patient had thrombocytopenia and splenomegaly which are known to be more commonly associated with STM than TBM.[3]

Dramatic clinical response to doxycycline and normalization of neurological status and CT within such a short period favored diagnosis of STM and hence ATT was omitted. Post-ATT withdrawal he continued to improve which further consolidated the diagnosis of STM.

Hence rickettsial meningitis should be kept as a differential diagnosis in cases of aseptic meningitis with basal meningeal enhancement and ventricular prominence on CT. Clinical differentiation between STM and TBM based on thrombocytopenia and splenomegaly could be highly useful. Facilities like rickettsial serology should be available even in peripheral hospitals in endemic areas to enable timely diagnosis. This case report lays down the foundation on which further research on neuroimaging findings in rickettsial meningitis can be conducted.

Conclusion

Scrub typhus meningitis can cause basal meningeal enhancement and early hydrocephalus on CECT brain.

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