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Very Rarely Reported MRI Brain Changes - Spectrum of MRI Brain Changes in Serological Proven Case of Scrub Typhus Encephalopathy for Early Diagnosis

Case Report

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Abstract

Introduction: Scrub typhus or bush typhus caused by Orientia tsutsugamushi is a common, zoonotic disease in South East Asia. Although CNS involvement in scrub typhus is well described but there are extremely rare documented studies of Brain changes in MRI in this infection. This is a case report of scrub typhus induced encephalopathy showing changes in Brain on MRI. The spectrum of MRI brain changes being reported by us is very important for scientific/medical community for correct early diagnosis and management, to save lives.

Methodology: Observational type of case study using 1.5 Tesla MRI. 45 years male presented with history of occipital headache for 5 days, projectile non-bilious vomiting and giddiness multiple episodes of upward rolling of eyes with loss of consciousness for few seconds and involuntary micturition. No known comorbidities. Patient is non-alcoholic, non-smoker, farmer by profession. Widal test was negative. Malaria and Dengue rapid card test - negative. Scrub typhus rapid card test - Positive for IgM antibodies (Inbios, USA).

Spectrum of Brain changes on MRI: T2 and FLAIR images showed hyperintensity in head of bilateral caudate nuclei and in bilateral lentiform nuclei (more so in putamen). Also noted were mild bilateral hyperintensities in thalami on T2 and FLAIR (more evident on FLAIR). Lesions showed no restricted diffusion on DWI.

Conclusion: Based on the patient's clinical and radiological characteristics, "Scrub Typhus Induced Encephalopathy" was diagnosed & it was confirmed serologically.

Keywords: Scrub Typhus Induced Encephalopathy; Mri,Thalami; Caudate Nuclei; Putamen.

Introduction

Scrub typhus is a well-known acute febrile illness caused by Orientia tsutsugamushi. Scrub typhus is endemic in the tropical and subtropical regions of the Asian continent. It is a re-emerging infectious disease in India as well as in other parts of the world like South Korea, northern China and Taiwan [9]. This disease has multiorgan involvement, which includes lungs, heart, liver, spleen, and central or peripheral nervous system [1-4]. Early diagnosis of scrub typhus with CNS involvement is extremely important, as it can alter the patient's treatment, prognoses and reduce mortality rates [4]. CNS involvement in scrub typhus has been described but there are extremely raredocumented studies of MRI brain changes in this infection [2].

Materials and Methods

Observational type of case study using 1.5 Tesla MRI. 45 years male presented with history of headache (occipital region), severe throbbing type with no aggravating and relieving factors since 5 days, vomiting since 1day- 2 to 3 episodes, non-projectile, non-bilious and containing food particles. Patient had giddiness 1 episode lasting for 2 minutes (head spinning type, no postural variation). Multiple episodes of upward rolling of eyes with loss of consciousness for few seconds and involuntary micturition. Patient had decreased appetite for 5 days, altered sleep. No complaints of photophobia, fever, bleeding manifestations, chest pain, palpitations, rhinorrhoea, sore throat, cough, abdominal pain and any abnormal movements. No known comorbidities. Patient is non-alcoholic, non-smoker, farmer by profession. No relevant family history. General examination within normal limits. Systemic examination of CVS, RS and per abdomen normal. CNS examination showed GCS- 15/15, Pupil 3mm - equally reacting to light, Tone normal in all 4 limbs, Power 5/5 in all 4 limbs. Plantar - flexor on sides and ankle, knee, biceps, triceps reflexes on both sides are normal. X-Ray Chest and ECG were normal.

Hb - 10.8 g/dl, PCV - 34.3% (normal 40-50%) on admission which later on showed improvement to Hb level 11.0 g/dl and PCV - 32.9% on discharge. Liver and renal function tests urine routine and microscopy were normal. Widal test was negative. Malaria rapid card test - negative. Dengue rapid card test - negative. Scrub typhus rapid card test - Positive for IgM antibodies (Inbios, USA).

Spectrum of Brain Changes on MRI

T2 and FLAIR images showed hyperintensities in head of bilateral caudate nuclei& inbilateral lentiform nuclei (more so in putamen). Also noted were mild bilateral hyperintensities in thalami on T2 and FLAIR (more evident on FLAIR). Lesions showed no restricted diffusion on DWI. These features were suggestive of Scrub Typhus Induced Encephalopath.

Discussion

Scrub typhus encephalitis syndrome has drawn public attention in recent years [3]. The pathophysiology of scrub typhus is not fully understood, though in general it is thought to be due to focal or disseminated vasculitis. Thetarget site of the organism is the vascular endothelium [10]. Important neurological manifestations of scrub typhus observed in many studies are mainly meningitis, meningoencephalitis, seizures, and altered sensorium [1,7]. Neurological features accompany 20% of scrub typhus infections, and may affect the central or peripheral nervous system, and sometime, may even occur in combination [8].There is limited literature on the neuroimaging findings of scrub typhus induced encephalopathy [1,5]. In this study, patient who underwent neuroimaging, showed abnormalities like T2-weighted and FLAIR hyper intensities in heads of caudate nuclei, lentiform nuclei (mainly in putamen) and thalami, indicating primary involvement of brain parenchyma [1]. However, a radiologic diagnosis based on MRI findings was not easy before because scrub typhus does not present typical featuresas reported earlier [4, 6].Though this study is limited by its size being a case report, but it is not difficult to say that the imaging findings mentioned above

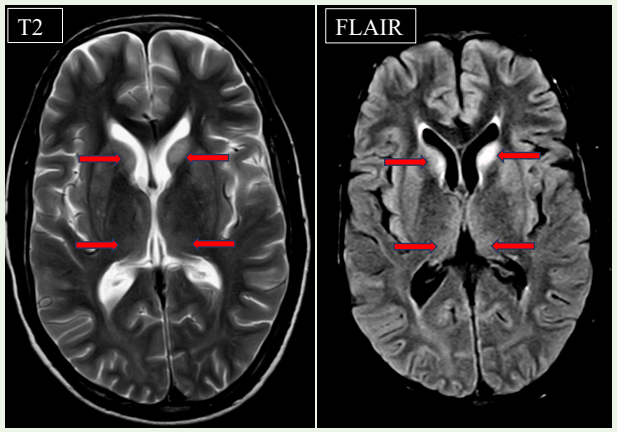

Figure 1: T2W and FLAIR axial section of MRI brain shows hyperintensities in head of bilateral caudate nucleus. Also seen is hyperintensity in thalami (more evident on FLAIR).

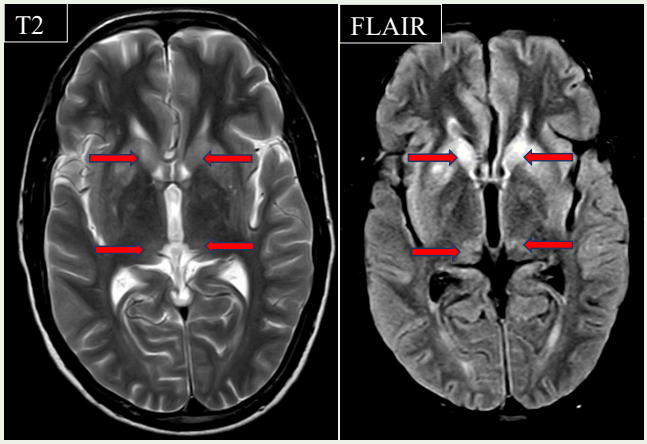

Figure 2: T2Wand FLAIR axial section of MRI brain shows hyperintensities in bilateral lentiform nuclei (mainly in putamen) and hyper intensity in thalami (more evident on FLAIR).

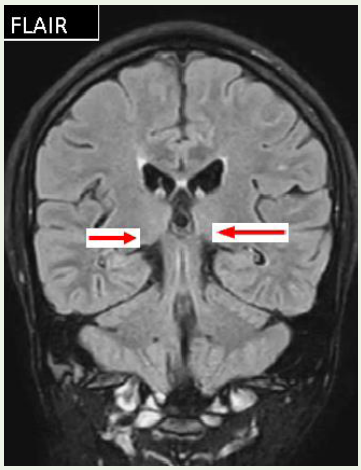

Figure 3: FLAIR coronal section of MRI brain shows hyper intensities in bilateral thalami.

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arehelpful in diagnosis of scrub typhus as these have been seen in a serologically proven case however larger studies on neuroimaging in scrub typhus infections are warranted. Never the less the spectrum of brain MRI findings in our case which on serology showed Scrub typhus IgM +, indicate that these MRI brain findings are indeed very helpful in suggesting the diagnosis of Scrub typhus encephalitis at the earliest to institute proper therapy at the earliest to save life. The timely instituted treatment after the diagnosis using Injection i.vDoxycycline 100 ml 8th hourly for 5 days, tablet Doxycycline 100 mg twice a day for 2 more days and tablet Azithromycin 500 mg OD for 5days along with other supportive medication made patient to recover.

Conclusion

Our patient presented with complaints of headache followed by seizure and vomiting. Serological examination revealed Scrub typhus IgM +.Radiological findings demonstrated involvement of basal ganglia (heads of caudate nuclei, lentiform nuclei- mainly putamen) and thalami. CNS involvement is not rare in scrub typhus; thus, clinicians should carefully consider a patient's complaints of neurologic symptoms, including headache, dizziness, and drowsiness. Recognizing typical radiologic findings as described in our case of scrub typhus may be helpful in early diagnosis of scrub typhus with CNS involvement, which may alter the treatment and prognoses of patients.

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