

Severe condition of Scrub Typhus Meningo-encephalitis in a child: a case report from Delhi, India.


 Malik R¹, Sharma S², Gupta R³, Sehgal R⁴

Correspondence to:

oum.shobha76@gmail.com
²**Dr. Shobha Sharma**, MD, Associate Professor, Department of Pediatrics, VMMC & Safdarjung Hospital, New Delhi.

¹**Dr. Richa Malik**, MBBS, Senior Resident, Pediatrics

³**Dr. Ratan Gupta**, MD - Senior Specialist, Pediatrics

⁴**Dr. Rachna Sehgal**, MD – Assistant Professor, Pediatrics

All authors are affiliated to

Department of Pediatrics, VMMC & Safdarjung Hospital, New Delhi, India.

Editors for this Article:

Dr. A.K. Pradhan, MBBS, MD, Professor, KIMS, Amalapuram, Editor-In-Chief, Medical Science.

Dr. Nirmala Mishra, MBBS, MD, Professor, Pharmacology, Lumbini Medical College, Editorial board member, Medical Science.

Dr. Arnab Ghosh, MBBS, MD, Associate Professor, Pathology, MCOMS, Editorial board member, Medical Science.

Cite this article:

Malik R, Sharma S, Gupta R, Sehgal R. Severe condition of Scrub Typhus Meningo-encephalitis in a child: A case report from Delhi, India.. Medical Science. 2014, 2(3):126-9.

Information about the article

Received: July 26, 2014

Revised: Sep.9, 2014

Accepted: Sep. 23, 2014

Published online: Sep. 30, 2014

Abstract

Intracellular parasites are the causative organism of Rickettsial diseases which are pathophysiologically associated with vascular endothelium and reticuloendothelial cells. Scrub typhus is one of the rickettsial infections, where fever is a common symptom. Apart from this, non specific constitutional symptoms and sometimes organ based deterioration including CNS has also been observed. There are reports of scrub typhus with CNS complication like meningoencephalitis in adolescent and adults from various parts of India but not from Delhi. Recently few cases of scrub typhus in adults were reported from Delhi without involvement of CNS. Its occurrence as severe case of hemorrhagic fever with meningo-encephalitis is rarer in children and not so far reported from state of Delhi. We present a case of 4 year old female child from Delhi presenting with scrub typhus meningo-encephalitis, whose timely diagnosis and management saved her life and make us notice the emergence of meningoencephalitic like picture in children in Delhi.

Key words

Children, Delhi, Rickettsial diseases, Scrub Typhus Meningo-encephalitis, Weil-Felix test



Background

Rickettsial diseases are caused by intracellular parasites which are pathophysiologically associated with vascular endothelium and reticuloendothelial cells [1]. One such rickettsial disease is scrub typhus, an important cause of fever of unknown origin in all age groups particularly in children [2]. In Asian countries this is one of the most common infections [3]. Generally, differential diagnosis required to rule out scrub typhus includes enteric fever, dengue, leptospirosis and malaria [4]. In India, most of the times Scrub typhus is underdiagnosed because of the nonspecificity in the signs and symptoms, lack of awareness among medical practitioners and shortage of diagnostic facilities. The most common pathognomic clinical sign of scrub typhus is the presence of eschar in 40–50% of the cases in different areas of body, like groin, gluteal folds, breast folds, and external genitalia [5]. Patients with scrub typhus, may exhibit mild-to-moderate neurological symptoms, but CNS involvement in scrub typhus in the form of meningo-encephalitis in pediatric population is less known [5, 6]. Sometimes, clues to diagnosis like travel history from endemic region or presence of skin lesion at site of tick bite (eschar) is absent. We report a case of 4 year old female from a non endemic region (Delhi) with acute hemorrhagic febrile illness with meningo-encephalitis. After ruling out other common clinical conditions like meningococemia, Hemorrhagic fever like dengue, enteric fever with complication and malaria, finally confirmed a case of scrub typhus meningo-encephalitis, whose early detection and management saved her life.

Case Report

A four year old female child, resident of New Delhi was admitted in emergency with fever of ten days and rash for four days starting from trunk and progressing to involve whole body. One day earlier to hospitalization, altered sensorium and generalized tonic-clonic seizure was noticed. There was no history of outstation travel in the recent past. On examination, child was very sick, febrile with proportionate tachycardia, tachypnea and BP of 100/60 mm Hg. Her face was puffy with generalized edema and vasculitic rash all over body varying from petechiae to purpura. Child was in altered sensorium with Glasgow Coma Scale (GCS) of 7/15 (E2 V1 M4), with hypertonia of all limbs, exaggerated deep tendon reflexes and extensor plantars. Cranial nerve examination was normal and fundus showed papilledema. Liver and spleen were significantly enlarged (4cm below right and left coastal margin respectively) without any evidence of free fluid in abdominal cavity. Keeping in mind commonly prevalent hemorrhagic fever like dengue, meningococemia, enteric fever with complication

and malaria, third generation cephalosporin, injectable artesunate and antiepileptic drugs were started empirically. Laboratory investigations showed anemia (Hb-7.1g%), thrombocytopenia (35,000/mm³), normal total and differential leucocyte count (9500/mm³), peripheral smear revealed normocytic normochromic red blood cells with no atypical cells. Coagulation studies, liver function test, renal function tests, serum electrolytes were in normal range. Some other investigations like malarial antigen test, dengue serology and Widal agglutination test showed negative results. Blood culture showed no organism growth. Guarded CSF examination after loading with mannitol was grossly clear with 45-50 cells/cc with 60% polymorphs, raised CSF protein (88mg%), normal sugar and no growth in CSF culture. Since tests for common infectious etiologies were negative and child did not show improvement with therapy, possibility of rickettsial infection was thought and serology for scrub typhus on Weil-Felix test with Proteus OXK antigen was sent to National Centre for Disease Control which came out to be positive (titre-1:160). ECG was recorded which showed mild diffuse and sluggish background activity - an indication of encephalopathy. Contrast enhanced CT scans of brain was normal. Doxycycline was added with which the child showed rapid improvement in mental status from GCS of 7/15 to 15/15 within 5 days of treatment. Along with clinical improvement (fever, rash, swelling and hepatosplenomegaly) laboratory parameters like platelet count improved from 35,000 to 55,000/mm³ on day 4 and 1,42,000 on day 9 of treatment. Repeat CSF on day 9 was reported normal. Tablet doxycycline was given for a total of 10 days. On follow up after 2 weeks of discharge the child was neurologically normal without any rash or hepatosplenomegaly and had normal platelet count.

Discussion

Orientia tsutsugamushi is the causative organism of scrub typhus, a rickettsial infection. Bite of larvae of trombiculid mites, which is considered as natural vector and reservoir, is responsible for the transmission of this disease among humans [7-10].

Epidemiological scenario in India

Rickettsial diseases have been reported from various regions of India in the recent past showing outbreak from time to time. Its presence has been documented in at least 11 Indian states [7-10]. Several reports of Rickettsial diseases in India are well documented stating the disease outbreak periodically. A main diagnostic criterion includes presence of eschar at site of tick bite along with patients travel history in the endemic region [11].



Scrub typhus & CNS involvement

CNS involvement is an uncommon complication of scrub typhus and occurs through hematogenous spread. In a report of Drevets DA shows in 5.7%–13.5% of patients suffers from Meningismus or meningitis [11]. Mahajan et al retrospectively analyzed data of scrub typhus positive cases for CNS involvement from 2004-2006 from India. Mahajan et al reported an interesting finding, only 14% cases of confirmed scrub typhus involved CNS [12]. Similar proportion of CNS involvement in pediatric age group was reported from a state with high prevalence in India, where out of 21 cases of scrub typhus, altered sensorium and meningoencephalitis was found in 4(19%) children [13]. Meninges is vulnerable for *Orientia tsutsugamushi* when compared with other rickettsial infections. The bacteria are found to parasitize endothelial cells in brain causing parenchymal lesions [14]. However, focal CNS damage is rare. From southern states also, there are reports of central nervous system manifestations in the form of drowsiness and seizures mostly in adults [15]. From Delhi, 4 cases have been recently reported in adults, but none of them had CNS involvement [16]. Several other Clinical manifestations of CNS include seizures, delirium, and loss of hearing. However, focal CNS damage is uncommon, but few complications like cerebellitis, myelitis, and cerebral hemorrhage were reported [17-19]. However reports of scrub typhus meningoencephalitis among the pediatric age group are relatively deficient.

Diagnostic approaches & treatment

Immuno-fluorescence assay (IFA) is the most acceptable choice of serological investigations, which confirms rickettsial infections [20]. but due to non-availability and expensive nature of this test, Weil-Felix test using the Proteus OXK strain is in use for many years which has low sensitivity but high specificity if comes positive [8]. The ratio of 1:80 or four times increase over previous levels is considered as significant. Antibiotic therapy is the best choice for the treatment of Rickettsiae for the prevention of morbidity and mortality. Tetracyclines (Doxycycline) and chloramphenicol is important in this context. This mode of treatment is also accepted by others [5]. A case report by Pai et al also states that doxycycline therapy was started at very early stages. Azithromycin has been proven to be more effective in doxycyclin-resistant strains. After the antibiotic treatment, rapid defervescence is the characteristic feature, which may be considered as a diagnostic test for scrub typhus. In this case elevated level of CSF proteins, which was an indication of this disease, helps us in differential diagnosis. The same pattern was observed in the report of Pai et al. [21].

Conclusion

In summary, we reported the first case of scrub typhus meningoencephalitis from Delhi. Weil-Felix test with Proteus OXK antigen was confirmatory test for the diagnosis. CSF analysis can also guide clinicians rapid recovery of scrub typhus in north India, our case report is important and a guide for clinicians to be more particular in certain acute hemorrhagic febrile cases to allow early diagnosis. Treatment with antibiotic is strongly recommended for quick recovery. Careful clinical supervision may reduce the rate of mortality and morbidity.

Abbreviations

Immuno-fluorescence assay (IFA)

Competing interests

Authors declare that, they do not have any competing interests. Informed consent was obtained from the guardians.

Authors' contribution

SS, RM, RG, RS contributed in the selection of the case, treatment, review of literature drafting the manuscript. Final manuscript was approved by all authors.

Authors' information

Dr. Richa Malik - Senior Resident, Department of Pediatrics, VMMC & Safdarjung Hospital, New Delhi
Dr. Shobha Sharma - Associate Professor, Department of Pediatrics, VMMC & Safdarjung Hospital, New Delhi
Dr. Ratan Gupta - Senior Specialist, Department of Pediatrics, VMMC & Safdarjung Hospital, New Delhi
Dr. Rachna Sehgal - Assistant Professor, Department of Pediatrics, VMMC & Safdarjung Hospital, New Delhi

Acknowledgments

Authors are thankful to the patient and family members.

References

1. Sahni SK, Rydkina E. Host-cell interactions with pathogenic Rickettsia species. *Future Microbiol.* 2009;4(3):323-39.



2. Sirisanthana V, Puthanakit T, Sirisanthana T. Epidemiologic, clinical and laboratory features of scrub typhus in thirty Thai children. *Pediatr Infect Dis J.* 2003;22(4):341-5.
3. Silpapojakul K. Scrub typhus in the Western Pacific region. *Ann Acad Med Singapore.* 1997;26(6):794-800.
4. Premaratna R, Chandrasena TG, Dassayake AS, Loftis AD, Dasch GA, de Silva HJ. Acute hearing loss due to scrub typhus: a forgotten complication of a reemerging disease. *Clin Infect Dis.* 2006 Jan 1;42(1):e6-8.
5. Saifudheen K, Kumar SKG, Jose J, Veena V, Gafoor VA. First case of scrub typhus with meningoencephalitis from Kerala: An emerging infectious threat. *Ann Indian Acad Neurol.* 2012; 15(2): 141–144.
6. Berman SJ, Kundin WD. Scrub typhus in South Vietnam. A study of 87 cases. *Ann Intern Med.* 1973;79(1):26-30.
7. Mahajan SK1, Rolain JM, Kashyap R, Bakshi D, Sharma V, Prasher BS, Pal LS, Raoult D. Scrub typhus in Himalayas. *Emerg Infect Dis.* 2006;12(10):1590-2.
8. Mahajan SK, Kashyap R, Kanga A, Sharma V, Prasher BS, Pal LS. Relevance of Weil-Felix test in diagnosis of scrub typhus in India. *J Assoc Physicians India.* 2006;54:619–21.
9. Chaudhry D, Garg A, Singh I, Tandon C, Saini R. Rickettsial diseases in Haryana: not an uncommon entity. *J Assoc Physicians India.* 2009;57:334–7.
10. Mathai E, Rolain JM, Verghese GM, Abraham OC, Mathai D, Mathai M. Outbreak of scrub typhus in southern India during the cooler months. *Ann N Y Acad Sci.* 2003;990:359–64.
11. Drevets DA, Leenen PJM, Greenfield RA. Invasion of central nervous system by intracellular bacteria. *Clin Microbiol Rev.* 2004;17(2):323–47.
12. Mahajan SK, Rolain JM, Kanga A, Raoult D. Scrub Typhus Involving Central Nervous System. *Emerg Inf Disease J.* 2010;16(10):1641-43
13. Digra SK, Saini GS, Singh V, Sharma SD, Kaul R. Scrub Typhus in Children: Jammu Experience. 12(2):95-97. URL: http://www.jkscience.org/archive/volume122/Scrub%20Typhus%20in%20Children_Jammu%20Experience17.pdf
14. Moron, C. G., V. L. Popov, H. M. Feng, D. Wear, and D. H. Walker. 2001. Identification of the target cells of *Orientia tsutsugamushi* in human cases of scrub typhus. *Mod. Pathol.* 14(8):752–759.
15. MVS Subhalaxmi, Naval Chandra, Ved Teja et al. Scrub typhus-experience from a South Indian tertiary care hospital. *BMC Infectious Diseases* 2012, 12(Suppl 1):77
16. Prakash A, Acharya AS, Jain N, Bhattacharya D, Chhabra M. Scrub typhus- an emerging public health problem in Delhi. *IJMS* DOI-<http://dx.doi.org/10.7713/ijms.2013.0044>
17. Silpapojakul K, Ukkachoke C, Krisanapan S, Silpapojakul K. Rickettsial meningitis and encephalitis. *Arch Intern Med.* 1991 Sep; 151(9):1753-7.
18. Kim DE, Lee SH, Park KI, Chang KH, Roh JK. Scrub typhus encephalomyelitis with prominent focal neurologic signs. *Arch Neurol.* 2000 Dec; 57(12):1770-2.
19. Yang SH, Wang LS, Liang CC, Ho YH, Chang ET, Cheng CH. Scrub typhus complicated by intracranial hemorrhage - A Case report. *Tzu Chi Med J.* 2005;17:111–14.
20. Digra SK, Saini GS, Singh V, Sharma SD, Kaul R. Scrub Typhus in Children: Jammu Experience. www.jkscience.org. 2012;12(2):95-97.
21. Pai H, Sohn S, Seong Y, Keem S, Chang, WH, Choe KW. Central Nervous System Involvement in Patients with Scrub Typhus. *Clinical Infectious Diseases* 1997; 24(3):436-40.