

## Scrub typhus and dengue coinfection in a 17-month-old child

Soumya Roy, Subroto Chakrabartty

From Department of Paediatric Medicine, Institute of Child Health, Kolkata, West Bengal, India

Correspondence to: Soumya Roy, Department of Paediatric Medicine, Institute of Child Health, Kolkata, West Bengal, India

E-mail: dr.roy85@gmail.com

Received – 14 March 2017

Initial Review – 22 April 2017

Published Online – 22 May 2017

### ABSTRACT

Scrub typhus is reemerging as a worldwide threat. In the tropical countries, where other diseases with overlapping clinical features are abundant, the occurrence of scrub typhus poses to be a significant problem to the clinician. We describe the case of a 17-month-old child who was diagnosed to be having a coinfection of scrub typhus and dengue. Various similar complications such as capillary leakage, thrombocytopenia, and possibility of seizure found in both the diseases, make such a coinfection very risky. The child was managed with oral azithromycin and fluid support. He became afebrile after 60 h and was discharged after 8 days. This case report will alert the pediatricians to anticipate the rare possibility of coinfection with scrub typhus and dengue fever.

**Key words:** *Scrub typhus, Rickettsial infections, Dengue, Co-infection, Children*

Scrub typhus is a reemerging threat [1] with clinical and laboratory features overlapping many other tropical infections. Although the treatment is both inexpensive and has excellent outcome, the laboratory facilities for diagnosing scrub typhus is not present in most of the places in India. Besides coinfection with some other pathogen such as *Salmonella*, malaria, or dengue virus remains a potential possibility in the tropical countries and can further complicate the picture. Coinfection of scrub typhus and dengue in the Indian subcontinent, though rare, has been previously reported. In 2015, Venkategowda et al. had published a case series of five such patients, while in 2016 Saleem et al. reported 15 similar coinfections [2,3]. Recently, Sapkota et al. published similar case in 2017 [4]. However, all these case reports were reported in adults. We describe the case of a 17-month-old baby who had coinfection with scrub typhus and dengue virus.

### CASE REPORT

A 17-month-old male baby from a rural area of West Bengal was admitted in the month of August with high fever for the past 10 days along with occasional cough and progressive abdominal distension for the past 4 days. There was no history of fever, travel, or pet exposure over the past 4 months. Baby also complained of increasing abdominal pain. On examination, he was extremely irritable with a temperature of 103° F, slight tachycardia, pallor, and peripheral edema. Cervical and inguinal lymph nodes were significantly enlarged and tender on palpation. There was a diffuse erythematous maculopapular rash throughout the body and a black necrotic eschar below the scrotum (Fig. 1). There were few crepitations on chest bilaterally, abdomen was distended with palpable liver and spleen. Liver was soft, tender,

and enlarged 2 cm in the right midclavicular line with a span of 4 cm. Spleen was enlarged 1 cm below left costal margin and soft in consistency.

Routine investigations showed anemia (hemoglobin 8 g/dl), moderate leukocytosis (total leukocyte count 18600), thrombocytopenia (platelet  $1 \times 10^5$ /cc), hypoalbuminemia (albumin 3.3 g/dl), hyponatremia (sodium 133 mEq/L), and moderate elevation of hepatic enzymes (serum glutamate-pyruvate transaminase 140 U/L) as well as C-reactive protein (80 mg/dl). Chest X-ray showed bilateral pleural effusion. Ultrasonography of abdomen showed mild ascites with hepatosplenomegaly. Microscopy for malaria parasite, enzyme-linked immunosorbent assay (ELISA) for malaria antigen as well as widal test was negative. Blood culture and urine examinations were also non-contributory. Meanwhile dengue IgM ELISA was found to be positive. Dengue NS1 antigen and dengue IgG were both negative. Weil-Felix test (OX K 1:160, OX 2<1:20, OX 19<1:20) and IgM ELISA (2.982) for scrub typhus were both positive.

Initial diagnosis of scrub typhus was made due to the presence of characteristic eschar. Besides our hospital has been experiencing an increasing number of scrub typhus patients over the recent years, perhaps both due to global reemergence of the disease as well as the increasing index of suspicion in our hospital. As such, the child had been empirically started on oral azithromycin 10 mg/kg (and continued for 5 days) even before the reports were received. However, as soon as the dengue reports were available, the IV fluid was changed to normal saline. Respiratory rate, heart rate, oxygen saturation, blood pressure, and urine output were constantly measured. On the 3<sup>rd</sup> day, (after 60 h of admission) he became afebrile and improved clinically. However, he started to have mild respiratory distress with decreased urine output from the afternoon. IV normal saline was started at 6 ml/kg/h. After



**Figure 1: Eschar**

36 h, there was improvement in respiratory symptoms as well as urine output. IV fluid was gradually decreased to maintenance rate and later stopped. Lymphadenopathy, serositis, and hepatomegaly regressed and the child was discharged after 8 days in a healthy condition.

## DISCUSSION

Scrub typhus is the most common Rickettsial disease in India. It is caused by *Orientia tsutsugamushi* and is spread by chiggers. It is a serious reemerging threat as untreated cases may have 30-35% mortality [1]. The eschar is characteristic of scrub typhus; however, differences in the skin immunity and possible previous exposure to the Rickettsia in endemic populations may be the cause of the absence of eschar in many patients [5,6]. The American Academy of Pediatrics committee on infectious diseases has identified doxycycline as the drug of choice in Rickettsial infection in children of any age [7]; however, Phimda et al. showed azithromycin and doxycycline to be similarly efficacious [8]. Hence, in our case, initial empirical treatment was started with azithromycin.

Saleem et al. reported 15 cases of scrub typhus coinfection with dengue in adults [3] while Rajendran reported one case of coinfection in the pediatric age group [9]. Previous infection with any one of the agents in the recent past can render a false positive IgM ELISA in the present episode [3]. However, our case did not have any febrile illness in the past 4 months. The abdominal pain in our patient was due to vasculitis-induced mesenteric ischemia [10] which may occur in both dengue and scrub typhus. It is well known that third spacing of fluid (due to capillary leak) and polyserositis are possible in both scrub typhus and dengue fever as the basic pathogenic mechanism for both these infections is vasculitis and increased vascular permeability [1,11]. Besides the complications of dengue-like pulmonary edema and shock commonly occurs 24-48 h after the patient has become afebrile (critical phase of dengue) [12]. Hence, the pediatrician should observe the child for 48 h even after the child becomes afebrile.

Some other complications such as thrombocytopenia and seizure can occur in either of these infections and hence should be kept in mind during a co-infection [13]. Seizures have been reported both in children with scrub typhus [14] as well as dengue [15]. Besides high fever can also precipitate febrile seizure

in children and should be taken into account. Thus, it becomes profoundly important to look for features which might alert the clinician to look for a coinfection, even after having diagnosed one. Basheer et al. found that the coinfection cases have greater tachycardia, hypotension, transaminitis, and hypoalbuminemia, alteration in activated partial thromboplastin time and hospital stay compared to either infection alone.

The nadir platelet count was lower (mean platelet count in coinfection was  $2.17 \times 10^9/\text{cm}^3$  as opposed to  $63.8 \times 10^9/\text{cm}^3$  in scrub typhus and  $44.5 \times 10^9/\text{cm}^3$  in dengue alone) and the time needed to achieve the nadir platelet count was higher (median duration for coinfection was 3 days as compared to 4.5 days in scrub typhus and 5 days in dengue) in cases of coinfection [16]. Iqbal et al. reported a case of pancreatitis with multi-organ dysfunction syndrome (MODS) in dengue-scrub typhus coinfection and noted that coinfection should always be investigated in doubtful cases of infective pancreatitis [17]. All patients in the case series published by Venkategowda et al. had required mechanical ventilation and renal replacement therapy; as such, they concluded that any febrile patient with thrombocytopenia and MODS should be investigated for more than one tropical infection [2].

## CONCLUSION

Pediatricians should maintain high index of suspicion in cases of febrile illnesses not responding in the conventional way. This case report delineates that scrub typhus coinfection with dengue, though rare, may occur in children.

## REFERENCES

- Rathi N, Rathi A. Rickettsial infections: Indian perspective. *Indian Pediatr.* 2010;47(2):157-64.
- Venkategowda PM, Prakash YS, Harde Y, Rao SM. Scrub typhus in false-positive dengue patients. *Ann Trop Med Public Health.* 2015;8:34-6.
- Saleem M, Gopal R, Shivekar SS, Mangaiyarkarasi T. Scrub typhus and dengue co-infection among patients attending a tertiary care hospital at Puducherry. *Indian J Microbiol Res.* 2016;3(2):149-50.
- Sapkota S, Bhandari S, Sapkota S, Hamal R. Dengue and scrub typhus coinfection in a patient presenting with febrile illness. *Case Rep Infect Dis.* 2017;2017:3.
- Park J, Woo SH, Lee CS. Evolution of eschar in scrub typhus. *Am J Trop Med Hyg.* 2016;95(6):1223-4.
- Mahajan SK, Rolain JM, Kashyap R, Bakshi D, Sharma V, Prasher BS, et al. Scrub typhus in Himalayas. *Emerg Infect Dis.* 2006;12:1590-2.
- AAP Committee on Infectious Diseases. Rocky mountain spotted fever. In: *Red Book.* 27<sup>th</sup> ed. Elk Grove Village, IL: AAP; 2006. p. 570-2.
- Phimda K, Hoontrakul S, Suttinont C, Chareonwat S, Losuwanaluk K, Chueasuwanchai S, et al. Doxycycline versus azithromycin for treatment of leptospirosis and scrub typhus. *Antimicrob Agents Chemother.* 2007;51(9):3259-63.
- Rajendran A. Scrub typhus in paediatric age group: A report from a tertiary care hospital. *J Pediatr Sci.* 2011;3(2):e82.
- Chakrabartty S, Chakravarthy S, Pravin AC, Banerjee TJ, Banerjee C, Parichaya B. Typhus fever: A diagnostic dilemma. *J Pediatr Infect Dis.* 2015;10(1):32-4.
- Chang JP, Cheng CL, Asok K, Fong KY, Chee SP, Tan CK. Visual disturbances in dengue fever: An answer at last? *Singapore Med J.* 2007;48(3):e71-3.
- cdc.gov [Internet]. Dengue Clinical Guidance. Available from: <https://www.cdc.gov/dengue/clinicallab/clinical.html>. [Last accessed on 2017 Mar 10; Last updated on 2014 Sep 06].
- Kadam DB, Salvi S, Chandanwale A. Expanded dengue. *J Assoc Physicians*

- India. 2016;64(7):59-63.
14. Meena JK, Khandelwal S, Gupta P, Sharma BS. Scrub typhus meningitis: An emerging infectious threat. *J Med Dent Sci.* 2015;14(10):26-32.
  15. Pancharoen C, Thisyakorn U. Neurological manifestations in dengue patients. *Southeast Asian J Trop Med Public Health.* 2001;32(2):341-5.
  16. Basheer A, Iqbal N, Mookkappan S, Anitha P, Nair S, Kanungo R, et al. Clinical and laboratory characteristics of dengue-*Orientia tsutsugamushi* co-infection from a Tertiary Care Center in South India. *Mediterr J Hematol Infect Dis.* 2016;8(1):e2016028.
  17. Iqbal N, Viswanathan S, Remalayam B, Muthu V, George T. Pancreatitis and MODS due to scrub typhus and dengue co-infection. *Trop Med Health.* 2012;40(1):19-21.

*Funding: None; Conflict of Interest: None Stated.*

**How to cite this article:** Roy S, Chakrabartty S. Scrub typhus and dengue coinfection in a 17-month-old child. *Indian J Case Reports.* 2017;3(3):134-136.