CASE REPORT

Massive consolidation: a rare manifestation of paediatric Scrub typhus

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SUMMARY

Despite resurgence in the number of Scrub typhus cases, it still poses a diagnostic challenge as there is no prototype presentation. We report a case of a child with Scrub typhus who developed a massive consolidation. Despite such an extensive consolidation, respiratory symptoms such as cough and breathlessness were inconspicuous thereby posing a diagnostic dilemma. Upon serological confirmation, doxycycline therapy was initiated with a rapid and complete resolution of the pneumonia, both clinically and radiologically. The case is being reported to highlight this unusual presentation of Scrub typhus in children.

BACKGROUND

Scrub typhus is an acute febrile illness caused by *Orientia tsutsugamushi* and has made its presence felt for decades. There was considerable mortality and morbidity due to this disease among the troops deployed in South East Asia during World War II. After an initial decline in incidence, we are now noting an increase in the number of cases, probably due to a true resurgence of the disease besides an increased awareness of the condition.

In spite of an increased awareness, Scrub typhus is still underdiagnosed as the symptoms can be non-specific and protean thereby making every case a diagnostic challenge. We report a case of a child, with Scrub typhus, who presented with extensive pulmonary parenchymal involvement.

CASE PRESENTATION

A 9-year-old girl, hailing from a suburban area of South India, presented with a high-grade, intermittent fever of 8 days duration associated with chills and rigors, generalised body pain, headache, photophobia, vomiting and lethargy. There was no cough or respiratory difficulty. Examination of the patient revealed a febrile, sick looking child with tender axillary lymphadenopathy and a reddish maculopapular rash over both legs. A shallow ulcer was found in the right groin (figure 1) with no evidence of a necrotic scab. Systemic examination was unremarkable except for mild hepatomegaly and a palpable spleen tip.

On the second day of hospitalisation, air entry was found to be reduced over the left infra clavicu- lar, mammary and axillary areas with impaired per- cussion note, without signs of respiratory distress or evidence of mediastinal shift. Respiratory symp- toms such as cough, chest pain and breathing diffi- culty were conspicuously absent. Her heart rate was

Figure 1 Ulcer with necrotic base over the right groin.

108/min, respiratory rate 20/min, blood pressure 100/60 mm Hg with an oxygen saturation of 97% in room air.

INVESTIGATIONS

Haemogram was essentially normal except for thrombocytopenia, on two occasions, with platelet counts of 138×10^9 and 148×10^9 cells/L, respectively. Tests for malarial antigen, dengue serology and Widal were negative. Blood culture was sterile. Inflammatory markers such as erythrocyte sedimentation rate and high sensitivity C reactive protein were elevated (42 mm/1 h and 57.44 mg/L, respectively).

The chest X-ray showed consolidation of the left upper and lingular lobes, nodular opacities in the right middle and lower zones with no mediastinal shift (figure 2). Ultra sonogram of the chest did not

Figure 2 Chest X-ray—massive consolidation on the left and nodular opacities on the right side.

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reveal any pleural effusion. Weil-Felix test titre was more than 160 for OXK antigen while the OX2 and OX19 titres were negative. Immunoglobulin M (IgM) ELISA for Scrub typhus was found to be strongly positive (optical density (OD) value 7.105).

DIFFERENTIAL DIAGNOSIS

Although Scrub typhus was the most probable diagnosis in the setting of fever, lymphadenopathy, rash and ulcer alternate possibilities like dengue fever, malaria, enteric fever were also considered in view of thrombocytopenia and ruled out by appropriate investigations. As the child had a massive consolidation, we also considered a bacterial aetiology until serological confirmation proved a rickettsial aetiology.

TREATMENT

The child was diagnosed as a case of Scrub typhus with massive consolidation and administered an oral doxycycline (2.2 mg/kg/day) course for 5 days.

OUTCOME AND FOLLOW-UP

There was a rapid defervescence of fever and significant improvement in air entry within 24 h (figure 3) of starting the medication. A repeat chest X-ray, taken after the completion of therapy, showed a complete clearance of the consolidation and nodular opacities (figure 4).

DISCUSSION

Scrub typhus is a rickettsial infection caused by *O. tsutsugamushi*. The larva (chiggers) of the trombiculid mite (genus *Leptotrombidium deliense* in India), serves as the vector and reservoir. Only the infected larval stage can transmit the disease

and there is no known human-to-human transmission. It is endemic to India, Indonesia, Japan, Korea, Maldives, Myanmar, Nepal, Sri Lanka, Thailand and northern Australia. In India it has been reported from the North, Northeast and the South.

Scrub typhus can present as an undifferentiated fever or with involvement of multiple systems. Pleuropulmonary manifestations of Scrub typhus are well documented¹ and they present most commonly with cough, tachypnoea^{2 3} and infiltrates on the chest X-ray. The lung manifestations are usually interstitial pneumonia,^{4 5} pleural effusion⁶ or haemorrhage⁷ all of which are vasculitis mediated.⁸ In a series of autopsies performed in patients dying of Scrub typhus, interstitial pneumonitis was documented in all patients.⁹

Massive air space consolidation and nodular opacities, as seen in this case, are very uncommon manifestations.^{10 11} Our case did not have marked respiratory symptoms like cough or respiratory difficulty but had a significant consolidation on X-ray, making it an unusual presentation. Consolidation of upper and lingular lobe, as in the case reported here, has not been documented in literature, so far, although lower zone pneumonitis has been reported earlier.^{10 12}

Symptomatic pleuropulmonary disease and early pneumonitis, suggested by infiltrates on the chest X-ray, can presage the development of acute respiratory distress syndrome^{6 12 13} by a few days, thereby making them prognostic indicators. Delay in initiating specific therapy may result in acute respiratory distress syndrome (ARDS).

In this child, it was the presence of the shallow ulcer in the groin that made us suspect Scrub typhus even in the absence of an eschar. It is reported that in warm and damp areas of the body such as the axilla, perineum, etc a shallow ulcer with a

Figure 3 Defervescence of fever following doxycycline therapy.

Figure 4 Complete resolution of the chest X-ray findings following treatment.

purulent base is more common than the classical necrotic eschar.¹⁴ Furthermore, the response to doxycycline was so dramatic that it served as a diagnostic test. It is interesting to note that in a study from China, by Liu *et al*,¹⁵ children with an abnormal chest radiograph took a significantly longer time to defervesce. This is at variance to the rapidity of response in our case, probably indicating ethnic variations in clinical response.

Although the gold standard for the diagnosis of Scrub typhus is the immunofluorescent antibody test (IFA), its use in the diagnosis is limited by the high cost and lack of universal availability. Currently, most centres use IgM ELISA for confirming the diagnosis of Scrub typhus. Although the Weil-Felix test to detect OXK has a low sensitivity, along with a high rate of false positivity especially in proteus infections, it is highly specific and can still be used as a useful screening test in endemic areas.¹⁶ It helps in making an early diagnosis in suggestive clinical

settings, thereby justifying the use of doxycycline in order to prevent morbidity and mortality.

Although the awareness of Scrub typhus has increased, it is still under diagnosed due to the lack of specific symptoms, the absence of eschar in some cases and the lack of a specific antigen-based diagnostic test.⁶ Thus, in any undifferentiated fever, a high index of suspicion, meticulous search for an eschar and a thorough clinical examination of all systems can help clinch the diagnosis of Scrub typhus.

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Learning points

- ▶ Massive consolidation may present without cough or respiratory difficulty in paediatric Scrub typhus.
- ▶ Radiological clearance is much earlier, in Scrub typhus, as compared with bacterial pneumonias.
- ▶ A shallow ulcer can be the only finding, in lieu of a typical eschar, especially in moist areas.

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