

A Rejang River rash

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Case history

A 30-year-old Iban woman presented to a rural primary healthcare clinic located along the Batang Rejang in Sarawak. She had a 2-day history of rash, which started over her trunk and later spread to her face and limbs. What started out as individual erythematous maculopapular spots later coalesced to form larger raised blotches. The rash was extremely pruritic and affected her sleep, and hence her visit. The rash was preceded by high grade, persistent fever that was temporarily relieved by paracetamol. She also complained of malaise, arthralgia and myalgia. Her appetite had been poor since the onset of the fever.

She lived in a long house at the edge of the jungle. Although she did not have a history of going into the jungle to forage, she went regularly to the river to wash clothes.

Clinically, she appeared lethargic and had bilateral conjunctival injection. Her left anterior cervical lymph nodes were palpable. There were erythematous macules measuring 5 to 15 mm distributed over her whole body but predominantly over the chest and abdominal region (Figure 1). An unusual skin lesion was discovered at the right hypochondriac region. This lesion resembled a cigarette burn with a necrotic centre (Figure 2).

There was no evidence of hepato-splenomegaly. Examination of the other systems was unremarkable. On further questioning, the patient admitted being bitten by a 'kutu babi' or mite 3 days before the onset of her fever.



Figure 1. Distribution of rash over abdomen



Figure 2. Close-up of the lesion

Questions

1. What is the skin lesion?
2. What is the most likely diagnosis?
3. What is the organism responsible for this condition?
4. What investigations can be done to confirm this diagnosis?
5. What is the treatment of choice?

Answers

1. An eschar
2. Scrub typhus
3. The organism causing scrub typhus is *Orientia tsutsugamushi*. It is harboured by trombiculid mites whose main hosts are small rodents.
4. Weil-Felix OX-K agglutination reaction has been widely used as a serodiagnostic test because it is easily available, especially in primary care settings. However, this test lacks specificity and sensitivity. Indirect fluorescent antibody (IFA) and indirect immunoperoxidase (IIP) are better options to detect antibodies against *O. tsutsugamushi*.
5. Doxycycline 200 mg daily for a week.

Discussion

Scrub typhus is a zoonotic disease caused by *O. tsutsugamushi*. Its occurrence is highest in the 'tsutsugamushi triangle', which is bordered by Japan, Taiwan, China and South Korea in the north, India and Nepal in the west and Australia and Indonesia in the south. In Malaysia, an early study found that scrub typhus resulted in 23% of febrile hospital admissions in a district hospital in Pahang.¹

However, the exact prevalence of scrub typhus is still unknown as there is a discrepancy between the low numbers of reported cases and high prevalence of antibodies to *O. tsutsugamushi* in rural populations.¹ Among the indigenous group or 'Orang Asli's of West Malaysia, the prevalence of antibodies to *O. tsutsugamushi* ranged between 0% and 36.4%.² In Sarawak, 3.8% of the 261 indigenous settlers along the upper reaches of the Rejang River were seropositive when tested for a rickettsial infection. Out of those tested positive, one-third of them were due to scrub typhus, whereas the majority was due to tick typhus. The semi-nomadic Penans had the highest rates of typhus as they were dependent on the jungles and rivers for their daily dietary requirements, and hence greater contact with typhus-bearing vectors.³

Scrub typhus occurs as an acute febrile illness with non-specific symptoms and signs. Rash, diffuse lymphadenopathy and myalgia usually accompany the fever. In countries where it is endemic, scrub typhus is the main cause of pyrexia of unknown origin.⁴ An eschar forms at the site where the mite bites. Despite being pathognomonic for scrub typhus, eschars are uncommon among South East Asians or those in endemic areas where the illness presents less severely.⁴ Even if present, they may be harder to detect in dark-skinned individuals.¹

Most of the time, diagnosis depends on clinical suspicion. Scrub typhus needs to be differentiated from other causes of acute febrile illness such as malaria, dengue and leptospirosis, which may present similarly. One of the oldest diagnostic tests available is the Weil-Felix OX-K agglutination reaction. Although fast, cheap and easy to perform, this test has specificity and sensitivity flaws. Serologic testing via indirect fluorescent antibody (IFA) or indirect immunoperoxidase (IIP) is the current gold standard. Polymerase chain reaction (PCR) can also detect *O. tsutsugamushi* DNA in samples tested negative using IFA.⁵

Treatment should be initiated upon presumptive diagnosis and should not be delayed while awaiting laboratory confirmation. If left untreated, severe cases can progress to septic shock, multi organ failure and even death. Early antibiotic treatment shortens the course of the illness and reduces mortality.⁴ Although the treatment of choice is doxycycline 200 mg OD for a week, other alternatives include tetracycline 500 mg QID, rifampicin 900 mg OD and chloramphenicol 500 mg QID for a similar duration. Recently, it was discovered that a single oral 500 mg dose of azithromycin is equally effective in mild cases of scrub typhus.⁶ In more severe cases, intravenous antibiotics may be required.⁴

Travellers to endemic areas can protect themselves by using dimethyl phthalate-impregnated clothing and applying a N-diethyl-meta-toluamide (DEET) - based repellent to exposed skin.^{4,7} Minimising skin exposure by wearing appropriate clothing will also reduce the risk of a mite bite. Although a vaccine is not available, chemoprophylaxis with a weekly dose of doxycycline 200 mg is effective against scrub typhus.⁷

Physicians should have a high index of suspicion for scrub typhus in those presenting with an acute febrile illness especially among individuals from rural areas. A thorough clinical examination is important to avoid missing signs that might otherwise help clinch the diagnosis. Early treatment with antibiotics prevents complications and death.

Conflict of interest

None

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