



Travel Acquired Scrub Typhus

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Introduction

All ages are at risk for rickettsial infections with travel to endemic areas, especially when participating in outdoor activities during spring and summer months when ticks and fleas are most active, but infection can occur throughout the year. Game hunting, traveling to southern Africa, and traveling during November through April represent specific risk factors for ATBF in travelers (1). One study (2) estimated that the risk of a traveler contracting a rickettsiosis in southern Africa is four to five times higher than that of acquiring malaria. Contact with tick-infested dogs in areas endemic for certain SFG rickettsiae increases risk of acquiring disease. Outbreaks of rickettsialpox most often occur following contact with infected rodents and their mites, especially during natural die-offs or extermination of infected rodents that cause the mites to seek out new hosts, such as humans.

Most travel-acquired cases of scrub typhus occur during visits to rural areas in endemic countries for activities such as camping, hiking, or rafting. Humans exposed to flea-infested cats, dogs, and peridomestic animals while traveling in endemic regions are at greatest risk for flea-borne rickettsioses. Travelers at greatest risk for epidemic typhus include those who may work with and/or visit areas with large homeless populations, impoverished areas or refugee camps, and regions that have recently experienced war or natural disasters, especially during the colder months. Sylvatic epidemic typhus cases occur only from direct contact with flying squirrels or their nesting materials. Sennetsu fever can be contracted from consuming raw infected fish (3,4,5).

Among the 225 cases of rickettsial disease confirmed between 1980 and 1982, 118 cases of mediterranean spotted fever were acquired in the south of France during the summer. The other cases of spotted fever and all the cases of murine, louse-borne and scrub typhus occurred in tourists who had recently come back from countries where rickettsial morbidity still persists (6).

In a study from Norway investigating epidemiologic and clinical aspects of rickettsial diseases in 280 international travelers reported to the GeoSentinel surveillance Network during 1996-2008. Of these 280 travelers, 231 (82.5%) had spotted fever (SFG) rickettsiosis, 16 (5.7%) scrub typhus, 11 (3.9%) Q fever, 10 (3.6%) typhus group (TG) rickettsiosis, 7 (2.5%) bartonellosis, 4 (1.4%) indeterminable SFG/TG rickettsiosis, and 1 (0.4%) human granulocytic anaplasmosis. One hundred ninety-seven (87.6%) SFG rickettsiosis cases were acquired in sub-Saharan Africa and were associated with higher age, male gender, travel to southern Africa, late summer season travel, and travel for tourism (7).

Epidemic typhus was reported last year in the United States when an outbreak of murine typhus was recorded in Hawaii. Among spotted fever group rickettsioses, African tick bite fever is now probably the most common rickettsial infection in Africa with numerous cases also reported in international travellers. For the first time the Astrakhan fever rickettsia has been described outside Europe, in a French patient returning from Chad. Similarly, the first case of *Rickettsia sibirica mongolotimonae* infection in Africa was reported in 2004. Finally, a newly recognized agent of a spotted fever rickettsiosis, *Rickettsia parkeri*, has been reported in the United States during 2004 (8).

Physicians caring for febrile returned travelers face the difficult task of recognizing the typical and atypical features of more than 16 known rickettsial diseases and separating these diseases from potentially serious nonrickettsial diseases. Currently available diagnostic tools are inadequate for timely diagnosis. Travelers with imported rickettsial disease often become sick before or within a few days of return from an endemic region. Illness that begins more than 18 days after return is unlikely to be rickettsial in origin. The absence of a skin rash or exposure to a vector should not dissuade clinicians from considering the possibility of a rickettsial disease in a returned traveler.

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Finally, if empiric therapy does not result in defervescence within 48 hours, an alternative nonricketsial illness should be strongly considered (9).

Clinical Features (1-9)

1. The onset is acute with chills and fever (104°-105° F), headache, malaise, prostration and a macular rash appearing around the 5th day of illness.
2. Generalized lymphadenopathy and lymphocytosis are common.
3. One typical feature is the punched-out ulcer covered with a blackened scab (eschar) which indicates the location of the mite bite.
4. The pyrexia falls by lysis in the 3rd week in untreated cases. The Weil Felix reaction is strongly positive with the Proteus strain OXK.

Diagnosis (1-9)

Scrub typhus may be diagnosed in the laboratory by:

1. Isolation of the organism
2. Serology
3. Molecular diagnosis (PCR)

The diagnosis can be confirmed at a later time by obtaining acute- and convalescent-phase serum from the patient. In patients suspicious for rickettsial disease, an acute-phase serum should be drawn and held in case serology becomes necessary at a later time. Most serum specimens collected during the acute stage of rickettsial diseases do not contain antirickettsial antibodies, although immune responses to scrub typhus rickettsiae can be very rapid. Thus, results of serological testing are only presumptive, sophisticated methods are crucial for the diagnosis and description of new rickettsial diseases, especially in atypical cases.

Treatment (1-9)

- a). Diagnosing a rickettsial infection can be difficult, but rapid treatment with appropriate antibiotic therapy is critical for rapid recovery.
- b). Treatment must be based on clinical suspicion and not be delayed pending results of laboratory tests.
- c). Antibiotics of the tetracycline class (doxycycline in particular) have a high degree of efficacy and low toxicity in treating rickettsial infections, even in children.
- d). Depending on the specific pathogen, chloramphenicol, azithromycin, fluoroquinolones, and rifampin may also be considered, but these are not universally effective for all rickettsial agents, nor have they been evaluated by controlled clinical trials.

e). The standard treatment regimen consists of 200 mg of doxycycline daily for 3-14 days or 2.2 mg/kg body weight per dose administered twice daily (orally or intravenously) for children weighing <100 lbs. (45.4 kg). However, the specific type and duration of antibiotic administered may vary, depending on the disease and kinetics of defervescence.

Preventive Measures for Travelers

- a). No vaccines or drugs are available for prevention.
- b). The best prevention is to minimize exposure to fleas, ticks & animal reservoirs when traveling in endemic areas.
- c). The proper use of insect repellents, avoiding vector-infested areas, and wearing protective clothing are important ways to reduce risk.
- d). Chemoprophylaxis can be administered using chloramphenicol or tetracycline every 5 days for a total of 35 days, with 5 day non-treatment intervals which if given to people in endemic areas produces active immunity to scrub typhus as one more method of specific protection (1-9).

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