Abstract
Scrub typhus has been previously reported from north and eastern Indian states and areas such as Kashmir, Himachal Pradesh, Assam, Sikkim, and Darjeeling district of West Bengal. It has also been known to be endemic in some parts of South India (Eastern and Western Ghats). However, no cases have ever been reported from the southern districts of West Bengal. Here, we report five cases of scrub typhus from South 24 Parganas and Kolkata, two districts in the southern part of West Bengal, India.

KEY WORDS: Eschar, rickettsia, scrub typhus, West Bengal

Introduction
Scrub typhus, a zoonosis, is an arthropod-borne disease (Trombiculidae mite) and is caused by Orientia tsutsugamushi (previous name: Rickettsia). This disease can be transmitted to humans by an arthropod vector of the Trombiculidae family. Leptotrombidium deliense and Leptotrombidium akamushi are the two most important vectors in India and many other Asian countries. Wild rats of subgenus Rattus are the natural hosts. These rats and mites are the reservoir. Humans are accidental hosts. The mite survives in areas such as beaches, mountains, deserts, and equatorial rain forests, riverbanks, and grassy regions.

It affects people of all ages and can cause high mortality that may reach up to 50% of the cases depending on the virulence of the strain of O. tsutsugamushi involved. Host factor and timely intervention can also play important role in the outcome of the disease.

Eschar is considered a pathognomonic clinical sign of scrub typhus. However, many diseases such as anthrax, ulceroglandular tularemia, and other rickettsiosis may have an eschar or similar lesion. Diagnosis and differentiation from these entities can be done clinically and through laboratory investigations.

Eschar in cutaneous anthrax is a necrotic lesion with discharge and intense surrounding edema without any other skin rash. Epidemiological evidence of the disease is generally present in the community. Ulceroglandular tularemia, caused by Francisella tularensis, very uncommon in India, presents with fever, lymphadenopathy, and edematous crusted ulcer that is deep, punched out in appearance, and persists for about 1–3 weeks. Among the rickettsial diseases presenting with fever and eschar, rickettsial pox, caused by Rickettsia akari, has never been reported from India. Indian tick typhus (ITT), caused by Rickettsia conorii, presents with fever, headache, arthralgia, myalgia, rash, eschar, and regional lymphadenitis. Eschar in ITT is covered with a brownish black scab (tache noire) and may ulcerate. Maculopapular, petechial, or hemorrhagic eruptions generally start near ankles, lower legs, and wrists and classically involve palms and soles and spread centripetally.

Scrub typhus has been previously reported from many areas in India including Darjeeling and surrounding hilly areas, but never from the southern districts of West Bengal. Here, we report five cases, from South 24
Parganas and Kolkata, who presented with fever and eschar from July 2013 to December 2015.

**Case Reports**

Age of the patients ranged from 23 to 41 years (average: 34.8 ± 6.2 years). None of the patients were field workers or farmers by profession. Patients presented with moderate-to-high fever, headache, eschar, and rash. Abdominal pain, nausea, vomiting, and shortness of breath were noted in four patients. Altered sensorium and decreased urine output were noted in one patient each [Table 1].

All the cases had formation of a typical eschar, characterized by an ulcer with dark-colored hemorrhagic crust (5–15 mm) and surrounding erythema. These lesions mostly started as papules and/or vesiculobullous lesions followed by ulceration [Figures 1-3]. Generalized and diffuse maculopapular rash, involving trunk and progressing centrifugally, with sparing of palms and soles, was noted in all patients.

Tests such as routine hemogram, blood sugar, urea, creatinine, liver function tests, serum electrolytes, and chest X-ray were done. Three patients had jaundice, hepatosplenomegaly, and abnormal liver function, and one patient had highly deranged liver and kidney function parameters (bilirubin - 2.4 mg/dL, serum glutamic oxaloacetic transaminase - 242 U/L, serum glutamic pyruvic transaminase - 136 U/L, and creatinine - 1.7 mg/dL). Low platelet was observed in two patients but none of them had any bleeding manifestations.

All cases were confirmed to be suffering from scrub typhus through immuno-chromatography.

Mantoux test, antigen for malarial parasites, immunoglobulin M (IgM) for dengue, Widal test, and blood culture for salmonella serology for hepatitis (HBsAG, IgM for anti-hepatitis A, and anti-hepatitis C virus), HIV (ELISA), and *Leptospira* (IgM) did not reveal abnormalities.

The hospitalized patients were treated with basic protocol. All patients were treated with doxycycline 100 mg twice daily for 2 weeks. It resulted in rapid response in all patients.

**Discussion**

Rickettsial diseases are reported to be re-emerging in the Indian subcontinent, with a more varied geographical distribution.[3-5] Scrub typhus, despite being the most common rickettsial disease in India, is one of the most important neglected zoonoses of public health importance in India.[6]

During the Second World War, there was an epidemic of scrub typhus, mostly among the soldiers in the Far East.
are at risk worldwide and about one million cases occur every year.\(^1\) This is endemic in the tsutsugamushi triangle which covers a huge 13 million km\(^2\) triangular area in the eastern world extending from Japan in the East and includes India, Pakistan, and Afghanistan. A large part of North and East India (Kashmir, Himachal Pradesh, Assam, Sikkim, and Darjeeling of West Bengal) and some parts of South India (Eastern and Western Ghats) are affected.

Despite the presence of an endemic zone in northern part of the West Bengal state (Darjeeling), there has been no previous report of scrub typhus in the southern part of West Bengal.

Absence of documented report does not necessarily mean absolute absence of the disease. We suspect lack of diagnosis and reporting rather than the actual absence of the disease in this area.

Diagnosis might be missed due to absence of eschar. Eschar is known to occur in 7%–80% of cases of scrub typhus. Presence of eschar in hidden body parts may affect detection. Dark skin color is also known to hinder its identification. More importantly, it is reported that eschar is rare in South-East Asian patients, and the indigenous people of endemic areas might less frequently develop typical eschar or even the other classical skin rashes and usually manifest with less severe illness.\(^8\) Moreover, many cases might have been treated with doxycycline without confirmation of the diagnosis. These facts, on the background of very low level of suspicion, might lead to absence of documented cases.

None of our cases in this series had any visit to the endemic zones of this or adjoining states. This report points toward the definite possibility of existence of many other undiagnosed cases being present in these locations, previously unknown for scrub typhus, and highlights the necessity for increased sensitivity among the physicians for suspecting scrub typhus.

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**Conflicts of interest**
There are no conflicts of interest.

**What is new?**
Scrub typhus exists in southern districts of West Bengal, India.

**References**

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