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Soldiers from Indo Myanmar Border Presenting With Scrub Typhus: Case Report

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Abstract: *Scrub typhus also known as tsutsugamushi disease is caused by orientia tsutatsugamushi which is transmitted to humans by bite of tromiculid mites(chiggers).It presents as an acute febrile illness with gastrointestinal symptoms and development of characteristic eschar lesion in the classical cases.*
We report case of two soldiers who travelled to possible mite endemic area at Indo Myanmar border and presented with acute febrile illness after two weeks of their return journey,Eschar was found in both of them and prompt treatment with doxycycline showed marked clinical, biochemical and hematological improvement.
Medical officers should consider epidemiological approach to diagnosis of disease and it has immense military significance as soldiers frequently travel to mite endemic areas due to their professional commitments.
Key Words: *Scrub Typhus, Eschar, Mite, Soldiers, Indo Myanmar Border*

I. Introduction:

Rickettsial diseases occur in all parts of the world and are a significant cause of morbidity and mortality [1]. Rickettsiae are being recognized as emerging or re – emerging pathogens in many places of the world [2, 3].

Scrub Typhus is caused by Rickettsia tsutsugamushi which is wide spread in South East Asia and Western Pacific region. In 1933, the Indian Armed Forces carried out screening of all fever cases by Weil Felix test. The Burma campaign and the Second World War saw increase in cases resulting in the formation of "Field Typhus Research teams" [4,5].

The infection is transmitted through the larval mites or "chiggers" belonging to the family *Trombiculidae* . Transovarian transmission of rickettsiae occurs in mites for several generations. Only the larval stage takes a blood meal[6].

Orientia tsutsugamushi is a gram negative, obligate intracellular organism with polysaccharides having antigenic similarity with Proteus OX-K antigen[7].It invades endothelial cells leading to significant vascular leakage and end organ injuries [8].Onset of illness is characterized by fever, headache, myalgia and gastrointestinal symptoms[7].Classical case have primary papular lesion with central necrosis and crusting thereafter to present as eschar at the site where chiggers had fed along with tender focal or generalized lymphadenopathy and maculopapular rashes[9].Organ involvement presents as interstitial pneumonia, first degree heart block, myocarditis, systolic murmur, splenomegaly, deafness, dysarthria or dysphagia[8].

Diagnosis of rickettsial disease relies on the clinical signs and symptoms, travel history to endemic areas and exposure to relevant arthropods. Serological tests are useful to confirm clinical diagnosis and currently preferred serological test to confirm scrub typhus is indirect fluorescent antibody technique[10].

Treatment of scrub typhus should be started early in course of illness to reduce mortality and morbidity due to disease. Doxycycline 200mg daily or tetracycline 500 mg six hourly in a day for 7-14 days is the treatment of choice.

Case detection, public education, rodent control and habitat modification are aimed at controlling the infection of scrub typhus in human population. People entering an exposed area should wear footwear such as boots with socks and clothes impregnated with miticidal chemicals and application of mite repellants to exposed skin surface. Repellents containing DEET (N N diethyl m-toluamide),dusting sulphur, dimethyl phthalate or benzyl benzoate have been suggested as suitable agents.

Chemoprophylaxis is recommended under special circumstances in certain areas where disease is endemic. Oral chloramphenicol or tetracycline given once every five days for 35 days, or weekly dose of doxycycline 200mg have both been shown to be effective regimens. There is no effective vaccine for scrub typhus due to enormous antigenic variation in O. tsutsugamushi strains and immunity to one strain does not confer immunity to another [11,12,13] .

Personnel of Paramilitary Forces of India deployed in Indo Myanmar border are at risk of exposure to Scrub typhus due to their occupational compulsions. This Case report reports Scrub Typhus as a cause of acute febrile illness among soldiers posted at Phek District of Nagaland along Indo Myanmar border **(Fig 1).**

II. Case Report:

Two middle aged soldiers posted at District-Phek, Nagaland,North-eastern India with history of travel to Indo Myanmar border two weeks ago presented to us with acute febrile illness of three days duration. There were associated symptoms of high to moderate grade continuous fever, global headache, myalgia, cough and gastrointestinal symptoms like small bowel diarrhea. There was no history of altered mental behavior, vomiting, palpitations, dysarthria, deafness or dysphagia.

Physical examination revealed body temperature of 101degree F and signs suggestive of moderate dehydration with no postural fall in blood pressure. One of the soldier had maculopapular rash over the body. There were no pallor, clubbing, cyanosis or lymphadenopathy. A single painless Eschar was found on the chest wall of both the soldiers but in different stages of evolution **(Fig.2 and Fig.3).**

Systemic examination revealed hepatosplenomegaly with normal central nervous, respiratory and cardiovascular system examinations.

Clinical features, presence of eschar and history of travel by a soldier to Indo Myanmar border with thick scrub vegetations made us to consider scrub typhus as our first provisional diagnosis although malaria, arbovirus infections like dengue, leptospirosis along with other infections like typhoid, meningococcal disease, infectious mononucleosis and acute retroviral infection of HIV were considered as differentials to the presenting complaints of the soldiers.

Laboratory investigations revealed **(Table-1)** that at presentation patients had thrombocytopenia, elevated liver enzymes with splenomegaly on ultrasonography. There were no evidence of proteinuria, elevation of serum creatinine, leucopenia or leucocytosis or any reticulonodular opacities on chest Xray. Scrub typhus antigen(IgM) by immunochromatic assay was positive in one but negative in other soldier whose eschar was not well formed.

III. Discussion:

Scrub typhus is widespread in the so called "tsutsugamushi triangle" which includes Japan, Taiwan, China and South Korea on the north, India and Nepal on the west and Australia and Indonesia on the south[14].

The soldiers who reported to us gave travel history of visit to Indo Myanmar border where possible Mite Islands are in abundance due to the prevailing diverse terrain and ecological conditions.

Fever, headache, conjunctivitis, lymphadenopathy and a vesicular lesion at the site of bite by larval mite or "chiggers' characterize a severe attack of the disease after an incubation period of 6-21 days[7] .The lesion turns into a punched out ulcer covered with a blackened scab (eschar). A macular rash may appear on the body by the 5th to 7th day and last for a few hours to days.

In our cases also the patients presented with acute febrile illness with gastrointestinal symptoms after 14 days of travel history to possible mite endemic area. On examination, eschar was found in both the cases but in different stages because in one of the case the lesion appeared early in papule stage while in other central necrosis have led to formation of characteristic black coloured lesion**.(Fig2 and Fig.3)**

Complications are usually seen in patients after first week of presentation. Patient with complications manifest as interstitial pneumonia, ARDS, renal failure, meningoencephalitis, myocarditis, gastrointestinal bleed, jaundice, septic shock and multiorgan dysfunction syndrome[15]. The reasons for wide variation of eschar, rash, increased severity of illness, ARDS and CNS complications are not clear.

In our cases we followed and monitored the cases for complications for one week and none of them developed any end organ involvement due to scrub typhus. Thrombocytopenia and transaminitis found at presentation showed improvement with treatment by doxycycline after 4-5 days.

Serological tests are main tools for diagnosis. Indirect immune of lorescence assay, latexagglutination, indirect haemagglutination, indirect immunoperoxidase assay [IIP], and enzyme linked immunosorbent assay are various serological tests available. The serological tests are available in selected centers only. Weil-Felix test is widely used due to lack of availability of specific tests. Diagnostic Weil-Felix agglutination shows greater than four times rise in titer to proteus OXK in paired serum. Single titer of >1:320 is also diagnostic However this test lacks sensitivity and specificity[16]. A rapid diagnostic test is available in which serum is applied to the reagent pad of the ICT strip and the results are recorded as positive, equivocal, or negative for the presence of the control and the IgM or total antibody lines.

In our cases we used rapid diagnostic assay (immunochromatographic ICT) for detecting scrub typhus and found to be positive in one but negative in the other case. The patient with initial negative ICT became positive subsequently after 1 week of follow up and this can be due to early presentation of the case to us when antigen level in the serum was low. Also the eschar lesion was in early stage in this patient on presentation.

Blacksell *et al*[17] assessed the diagnostic capacity of a rapid ICT and found that the sensitivity and specificity for the detection of IgM were 96.8 and 93.3%, respectively.

Doxycycline 200 mg daily or tetracycline 500 mg 6 hrly is treatment of choice. The duration of treatment is 7- 14 days. Treatment of less than a week is initially curative but may be followed by relapse. Chloramphenicol 500mg qid is an alternative.

Resistance to tetracycline has been noted in some areas and rifampicin should be used in areas where there is poor response to doxycycline alone[18].

In our cases also we have opted doxycycline 200 mg once daily for 14 days with defervescence occurring within 24 hours.

IV. Conclusion:

a) Scrub typhus is a re-emerging disease in India, Personnel belonging to Armed Forces are at risk of exposure to Scrub Typhus due to their deployment in typhus endemic foci .
b) It is an important cause of community acquired undifferentiated febrile illness in India.
c) It has to be considered in the differential diagnosis of PUO, Sepsis and Multi organ dysfunction syndrome.
d) Searching for an eschar in hidden areas of body is an important step towards diagnosis of scrub typhus.
e) Doxycycline is the drug of choice.
f) Diagnosis is done by IgM scrub typhus ELISA.

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Figures and Tables:

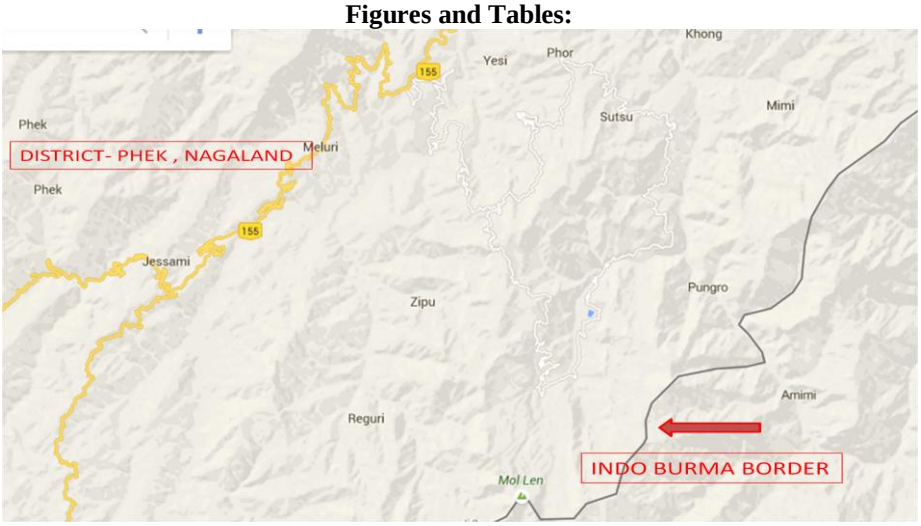

Fig 1: Map of District - Phek, Nagaland, India along Indo Myanmar Border

Fig.2- Well formed Eschar

Fig.3- Eschar in early stage

Table-1: Hematological/biochemical and special investigations

S/NO	INVESTGATION	CASE-1	CASE-1	CASE-2	CASE-2
		15/9/15	19/9/15	15/9/15	19/9/15
1.	HEMOGLOBIN(gdl)	13.8	13.0	14.7	13.8
2.	PLATELET(/miclt)	124000	297000	85000	178000
3.	LEUCOCYTE(/miclt)	8400	8000	4700	6200
4.	HEMATOCRIT(%)	42.8	39.5	46.9	40
5.	PT/INR	NORMAL	NORMAL	NORMAL	NORMAL
6.	TOTAL BILIRUBIN(mg/dl)	0.6	0.7	0.6	0.7
7.	SGPT/SGOT(IU/L)	112/130	80/103	80/162	94/116
8.	UREA(mg/dl)	39	27	20	15
9.	CREATININE(mg/dl)	0.6	0.7	0.6	0.3
10.	URINE RE	NAD	NAD	NAD	NAD
11.	CXR(PA View)	NAD	NAD	NAD	NAD
12.	RAPID MALARIA	NEGATIVE	-	NEGATIVE	-
13.	TYPHI DOT IgM	NEGATIVE	-	NEGATIVE	-
14.	HIV1/2 RAPID	NON REACTIVE	-	NON REACTIVE	-
15.	DENGUE(IgM/NS1)	NEGATIVE	-	NEGATIVE	-
16.	HBsAg/ANTI HCV	NEGATIVE	-	NEGATIVE	-
17.	SCRUB TYPHUS(RAPID ICA)	POSITIVE	-	NEGATIVE	POSITIVE (On 23/09/2015)
18.	USG(ABDOMEN)	SPLEEN 13.9cm	-	SPLEEN 13.0 cm	-
19.	ECG	NORMAL	NORMAL	NORMAL	NORMAL