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CASE STUDY

SCRUB TYPHUS-AN EMERGING PUBLIC HEALTH PROBLEM IN KOTA DIVISION OF RAJASTHAN

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ABSTRACT

Scrub typhus is being increasingly reported in India. It should be considered in the differential diagnosis of patients with acute febrile illness, including malaria, enteric and dengue fever. We report five cases of scrub typhus presenting as acute viral illness in month of September 2014 in our hospital. A thorough knowledge of the clinical features of scrub typhus including its complications and its varied presentations is important for providing early appropriate life saving empiric treatment for patients.

Key words:

Scrub Typhus,
Orientia, Doxycycline,
Chloramphenicol.

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INTRODUCTION

Scrub typhus, caused by *Orientia* (formerly *Rickettsia*) *tsutsugamushi*, is an acute infectious disease of variable severity that is transmitted to humans by an arthropod vector of the *Trombiculidae* family. "Tsutsuga" means small and dangerous and "mushi" means insect or mite. It affects people of all ages including children. Humans are accidental hosts in this zoonotic disease. While scrub typhus is confined geographically to the Asia Pacific region, a billion people are at risk and nearly a million cases are reported every year (Watt and Parola, 2003). Scrub typhus was first described from Japan in 1899. It was a dreaded disease in pre-antibiotic era and a militarily important disease that affected thousands of soldiers in the far east during the second World War (Groves and Harrington, 1994). The overall mortality varied from 7% to 9%, second only to malaria among infectious diseases. Furthermore, severe epidemics of the disease occurred among troops in Myanmar and Sri Lanka during the Second World War (McCallum, 2008). In India, scrub typhus broke out in an epidemic form in Assam and West Bengal during the Second World War. Later, the presence of this disease was found throughout India in humans, trombiculid mites and rodents (Park, 2009). It was the third most common infection reported in United States (US) troops stationed in Vietnam (Berman and Kundin, 1973). We have reported five cases of scrub typhus in the present paper from kota division of Rajasthan which were encountered in one particular tertiary set-up, in the month of September 2014.

This appears to be the tip of the iceberg. There are bound to be several more cases in the community, and it is likely that only the serious cases are seeking attention at tertiary set-ups.

REPORT OF CASES

Five cases of scrub typhus are being described; the salient features of each case are highlighted in Table 1.

Case one- A 40 year female, resident of Bundi district, presented with history of intermittent fever for 7 days and history of nosea and vomiting for 5 days. Patient had a five-day course of antibiotics and full dose of chloroquine before presentation. She complained of breathlessness for the last 48 hours and was drowsy, arterial oxygen saturation was 90% and crepitation were present on the right infra scapular area. Her blood presser was 90/60 mm/Hg, pulse rate 84/min and RR; 20/min. She had axillary lymphadenopathy on right side. A black eschar was present on the right side of chest. On probing, patient confirmed that she had sighted a papule at that site one morning on waking up, two days prior to developing fever, and thought it was an insect bite. There was no history of travel outside bundi. Chest radiograph showed lower zone opacities with normal heart size suggestive of suggestive of consolidation. Dengue antibodies, malarial antigen, HIV antibodies, hepatitis virus screen and widal tests were negative. With a provisional diagnosis of 'febrile illness with right lower lobe pneumonitis' was made. Injection Ceftriaxone and azithomycin with dopamine support was given. Over the next three days, crepitation was subsided but fever and vomiting was persisting. Subsequently scrub typhus was suspected and

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send ELISA for scrub typhus that was positive. Doxycycline was added in treatment. Patient had persistent fever after taken azithomycin (5 days) and doxycycline (7 days).finally patient was put on chloramphenicol. Subsequently patient was improved and discharged from the hospital.

Case 4- A 42 year male, resident of Baran district, presented with history of intermittent fever for 10 days with chills and rigor. It was associated with generalized body ache with nausea and vomiting. On examination, a typical eschar mark was presented on right sided of chest. Scrub typhus was suspected by typical eschar mark. However, doxycycline was given empirically. Fever was not subsided till 48 hours of institution of doxycycline.

Table 1. Clinico-biochemical features observed in the five cases of scrub typhus

Clinico-biochemical parameter	Case 1	Case 2	Case 3	Case 4	Case 5
Age(years)/sex	40/F	26/F	55/M	42/M	45/M
Occupation	House wife	House wife	Shop kipper	farmer	teacher
Patient recalls history of bite	yes	No	No	yes	No
History of recent travel	No	No	NO	No	No
Fever duration	7 days	7 days	10 days	10 days	14 days
Lymphadenopathy	present	present	present	absent	absent
Hepatosplenomegaly	present	present	present	absent	present
Respiratory symptoms	present	absent	present	absent	present
Gastrointestinal symptoms	present	present	absent	present	absent
Presence of eschar	chest	axilla	back	chest	absent
Rash	No	No	No	No	No
Hemoglobin (g/dl)	8	7.9	11.4	11.7	8.5
Total leukocyte count (/mm ³)	14170	3410	13210	8810	11950
Differential count	P38L59M2E1	P79L18M2E1	P77L18M5E0	P59L33M6E2	P53L43M3E1
Platelet count (/mm ³)	56000	92000	21000	237000	153000
Serum urea (mg/dl)	56	31	47	16	56
Serum creatinine (mg/dl)	0.6	0.8	1.2	0.7	0.8
Serum sodium (meq/L)	138	140	139	142	139
Serum potassium (meq/L)	4	3.8	4.1	4.6	4.3
Random plasma glucose (mg/dl)	72	94	56	80	68
Serum total bilirubin (mg/dl)	5.2	1.2	1	0.4	4
Serum alanine transaminase (U/L)	206	75	36	47	240
Serum aspartate transaminase (U/L)	330	201	96	83	401
Serum alkaline phosphatase (U/L)	1235	76	215	98	294
IgM ELISA for scrub typhus	positive	positive	positive	positive	positive

Case 2- A 26 year female, resident of Bundi district, presented with history of intermittent fever for 7 days without chills and rigors. It was associated with loose stools, vomiting and headache. On examination, an eschar was present in right axillary region, about which the patient was unaware. A possibility of enteric fever and acute viral fever with thrombocytopenia was entertained. HIV and hepatitis screen, malarial antigen, dengue serology and widal test were negative. There was no history of travel outside Bundi district. Patient was given injectable ceftriaxone. However, doxycycline was given empirically on day 2 of admission, although typical eschar was not present. The papule on the axilla ulcerated in the next couple of days and healed without forming the typical eschar. Fever subsided within 48 hours of institution of doxycycline. Rickettsial serology tested positive for scrub typhus.

Case 3- A 55 year male, resident of kota district, presented with history of intermittent fever for 10 days, dry cough for 5 day .it was associated with mild grade headache for 3 days. On examination, a typical eschar mark was present on the chest on left side (Figure 1). Left side axillary lymphadenopathy was also present. Scrub typhus was suspected by typical eschar mark. However, doxycycline was given empirically. Fever subsided within 48 hours of institution of doxycycline. Rickettsial serology tested positive for scrub typhus.

Then doxycycline was stopped and tab chloramphenicol was started. Fever subsided within 48 hours of institution of chalamphenicol. Rickettsial serology tested positive for scrub typhus.



Fig. 1. A typical eschar of scrub typhus

Case 5- A 45 year female, resident of Jhalawar district, presented with history of intermittent fever for 14 days with chills and rigor. It was associated with headache and dizziness. There was pain in right side of lower chest. No history of cough. On examination mild pallor and ictrus was present but there was no eschar mark on body. Her blood pressure was 110/70 mm/hg. Chest X-ray showed right side mild pleural

effusion. Provisional diagnosis of this case was complicated malaria and enteric fever was suspected. But HIV and hepatitis screen, malarial antigen, dengue serology and Widal test were negative. There was no improvement with injection Ceftriaxone and anti malarial medication. Finally ELISA test for scrub typhus has been send that was positive. Fever subsided within 48 hours of institution of doxycycline.

DISCUSSION

The clinical and laboratory features of scrub typhus are notoriously non-specific. The painless chigger bite can occur on any part of the body but it is often located in areas that are hard to examine such as the genital region or axilla (Mahajan and Bakshi, 2007). An eschar forms at the bite site in about half of primary infections which begin as small papules, enlarge, undergo central necrosis and acquire a blackened crust to form lesions resembling a cigarette burn (Mahajan and Bakshi, 2007). The fever starts abruptly and is of high grade. Severe headache, apathy, pain in skin and other muscles are associated symptoms. Characteristically, lymphadenopathy and hepato-splenomegaly are seen in the patients (Mahajan, 2005). The characteristic rash and eschar may not be always present (Mathai *et al.*, 2003). In our study all five patient was present in second week of illness.

Non-specific lung infiltrates with predilection to the lower zone have been described in scrub typhus (Choi *et al.*, 2000). in our study, one patient presented with high fever and features of atypical pneumonia, which was confirmed in the chest x ray. Previously described complications in patients include interstitial pneumonitis, atypical pneumonia, hepatitis, myocarditis, meningoencephalitis, disseminated intravascular coagulation and multi organ failure (Saah, 2000; Watt, 2003). in our study only one patient had pneumonitis that was recovered. On other hand in our study, most patients had elevation of serum transaminases, even without any other evidence of multi organ dysfunction. Other laboratory findings noted were leukocytosis, thrombocytopenia and anemia. Laboratory diagnosis of scrub typhus is based on serological and molecular diagnostic tests. Weil felix test has a low sensitivity and specificity but may be helpful in suggestive clinical settings (Pavithran, 2004). In the present study, we used ELISA testing for IgM antibodies against *O. tsutsugamushi* for diagnosis. This test has shown good sensitivity and specificity (Varghese *et al.*, 2006) and has been adequately validated (Varghese *et al.*, 2006).

The preferred drugs in the treatment include doxycycline and chloramphenicol. Doxycycline is usually given as 100 mg PO twice daily for 7 to 14 days. The alternative drugs used in scrub typhus include rifampin (600 to 900 mg/day) and azithromycin. An early treatment shows better outcomes and faster resolution than the delayed treatment; and delayed administration of antibiotics is independently associated with major organ dysfunction (Lee *et al.*, 2008). Patients treated with appropriate antibiotics typically become afebrile within 48 hours of therapy. in our study, mostly patients were improved by doxycycline and azithromycin. Only one patient was recovered by chloramphenicol.

In conclusion, the complications of scrub typhus can occur in 1st week of illness and severity range from a mild illness to myriad of life threatening events. The delay in diagnosis and treatment can result in the development of many complications and hence early diagnosis and treatment is important in reducing the mortality and morbidity. In developing countries, where scrub typhus is endemic, the need for the development of rapid high sensitive and commercially available diagnostic tests is very important. And also, the treatment of all acute febrile illness with empirical doxycycline can be considered pending diagnosis, especially in endemic areas.

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