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Eschar in various stages: A vital clue in febrile illness

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Abstract
Scrub typhus is a common aetiology for acute febrile illness in Indian circumstances, despite its commonness it is often considered late in the differential diagnosis, as its clinical features overlap with common tropical fever: typhoid fever, dengue and malaria. Moreover, lack of diagnostic facility by ELISA and IFA (immunoflorescene assay) in practice settings hinders its timely diagnosis. The pathologic basis of disease in scrub typhus is a vasculitis (infective) as the causative organism invades the endothelium. Understandably, it causes various organ impairment viz pneumonia, acute respiratory distress syndrome (ARDS), pericarditis, encephalitis, acute kidney injury, thrombocytopenia and hepatic injury, resulting in significant morbidity and mortality, when not suspected and treated early. Presence of eschar is a pathognomonic clinical feature, but its prevalence varies widely, however, when thoroughly sought for, it can provide a vital clue to this neglected entity, more-so, in resource limited setups where this single clinical finding in the setting of acute undiffe, rentiated fever can be life saving. We report a case of acute febrile illness, with dyspnea and interstitial infiltrates on chest Xray, who was treated as enteric fever since eight days, whereby the discovery of the eschar lead to timely diagnosis and intervention, halting the progression of the disease to severe pneumonia and ARDS.

Keywords: eschar, various stages, vital clue, febrile illness

Introduction
Scrub typhus infection remains an important diagnostic consideration in acute undifferentiated fever (AUF) in India [1], a febrile illness of less than two week duration. It is a zoonotic disease, caused by Orientia tsutsugamushi, and is transmitted by trombiculid mites found on the long grasses (common cause in rural exposure) and in the dirt (homes, other locations) in endemic areas [2]. The reservoirs for infection are the chiggers (larva of trombiculid mite) with rats and humans, being accidental hosts. The initial presentation of scrub typhus, is a flu like illness with fever headache myalgia and arthralgia, which variably progresses to involve multiple organs in some individuals. As its initial presentation is like a viral prodrome it is not considered in the initial week of illness, subsequently as the disease manifests as various organ dysfunction (the pathologic basis [4]. of which is a vasculitis), it may be treated on lines of those organ syndromes: pneumonia and ARDS, or meningitis and encephalitis, empirically, rather than as scrub typhus resulting in disastrous consequences. In fact, such practice scenario in relation to Scrub typhus is the reason for it being called as a seriously neglected disease [2]. To allow clinicians to consider it early, ICMR now rightfully, calls for considering any fever of five or more days duration as a possible scrub typhus [3]. Eschar is the result of chigger bite in certain individuals, its prevalence has varied widely ranging from 7-90%, considered to be less common in southeast Asians [5, 6].

Case Report
A 56-year-old bank employee, presented with fever since ten days, myalgia, and dyspnea, he was a known diabetic under treatment, he had no history of coronary artery disease (CAD), he was non-smoker and non-asthmatic. There was no travel history for any recreational activities. He was treated on lines of enteric fever with cefixime and ofloxacin since one week, he was evaluated in an emergency setup a day prior to this visit, because he felt unwell and in respiratory distress, where his routine labs were found to be normal except for mild hematuria and proteinuria, and CXR suggested left infiltrates (figure 5). He declined any further evaluation and reported to outpatient department (OPD) the next day. On examination he looked sick and in distress, disproportionate to his temperature or other vital parameters; his temperature was 101*F, BP was 100/70, chest auscultation revealed bilateral crepitations (L>>R). A detail examination after disrobing him, revealed an Eschar on the back of his hand (upper right tricep region), with accompanying axillary lymphadenopathy on the right side. He was unaware of eschars presence as it was located on the posterior torso of hand, escaping his field of vision, furthermore, it didn't cause any pain or pruritus to allow detection. His further systemic examination was unrevealing. As an eschar is considered pathognomonic of scrub typhus and his reluctance for further investigations, he was empirically initiated treatment with Doxycycline, his sample was preserved for IgM ELISA for Scrub Typhus testing (with InBios USA kit) for academic interest, which later came out to be positive at 3.5 OD (optical density). He had a dramatic response to treatment and became afebrile within 24 hours, along with improvement in his general condition and dyspnea. His eschars progression over the subsequent visits is noted below (figure 2-4). His further IgM testing after a week of therapy remained positive allowing confirmation of scrub typhus. He had a complete recovery.

Discussion
Scrub typhus remans seriously under-diagnosed and neglected disease [2]. the basis of which is discussed above. Emphasising the need for its early diagnosis, ICMR now calls for considering scrub typhus as a differential diagnosis in every acute undifferentiated fever (AUF) [1]. of greater than five days

duration [3]. Scrub typhus is an acute febrile illness caused by O. tsutsugamushi; [2]. the incubation period of which ranges from 6-21 days, in view of the variable incubation the outdoor exposure if any might have been forgotten by the patient. Moreover, in endemic area, house dust can lead to the exposure with trombiculid mites. Pathologic basis [4]. of the disease in scrub typhus is vasculitis, as the infective organism invades the endothelium, consequently, scrub typhus results in involvement of many organs leading to multi organ dysfunction (MODS) if not treated timely. Eschar [5,6]. is the result of mite bite, which is usually painless, The eschar begins as a small papule, a 'red lesion' as depicted in (fig 1), this early reddish lesion may be easily missed and considered as something else, this papular lesion then further enlarges and undergoes central necrosis—the basis for naming it eschar [8]. Of particular not is its differentiation with scab, which is constituted of dried blood and tissue exudate from wound, in contrast to eschar which is a necrosed tissue. Many a times, as the lesion has no pain, patient and their attendants consider it as scab as a result of some minor trauma downplaying its significance [7].

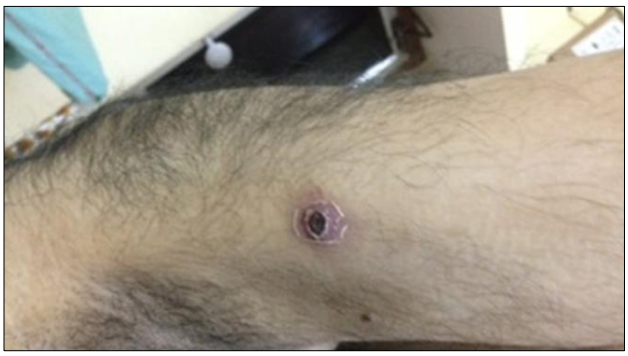

Fig 1

The full blown eschar has the following components: a central necrotic element which appears as a blackened crust, surrounded by an erythematous rim, which acquires scales, initially, at the interphase, of the crust and erythema and progresses to the periphery (a tricentric appearance) [10]. as the lesion evolves (fig 2-4). The blackened crust with surrounding erythema has been likened by some observers to a 'cigarette burn'. Finally Necrotic centre diminish in size along with decreased scales (fig - 4). Eschar as mentioned above, is the result of initial host and mite interaction. it is considered as a pathognomonic clinical sign of scrub typhus [6]. eschar is often neglected [12]. in clinical practice as detail general examination after disrobing the patient is seldom done. heralds the onset of symptoms as observed in this case; the usual sites [5,6]. are those area of the skin which oppose each other, like axilla, inguinal region, sub-mammary, or sites of cloth attaching the skin firmly like, waist and genitalia. Although the reasons for such preferential locations is not exactly clear, but might be due to the fact that interposed skin and skin with tight clothing allows the mite to attach firmly to the host for a prolonged period causing the lesion. Few observers have suggested draining lymph node enlargement as an important clue to chigger bite and scrub typhus [11]. In-fact, an infectious mononucleosis form of presentation has been reported in scrub typhus. The reported prevalence of eschar is variable ranging from 7% to 90%, [5,6] eschar is considered to be less common in south-asian population, although thorough examination of patients has resulted in a reported prevalence of around fifty percent [5]. moreover, presence of eschar in scrub typhus is considered a good prognostic sign [9].

This presentation aims to create awareness of eschar in its various stages, as a clinician may find any one stage of lesion in practice and needs to initiate prompt therapy based on that stage of lesion, which may not be a typical lesion initially (fig 1). Moreover, diagnostic facilities for scrub typhus is not readily available in peripheral setups, emphasising to make a thorough search for eschar when fever is persistent and the patient looks disproportionately sick. The sick look is hard to miss clinically. The above patient also had pneumonitis (fig 4) which if not timely intervened would have resulted in ARDS [2]. endangering life. The reported mortality with MODS in scrub typhus ranges from 30-45% in late treated patients [2].

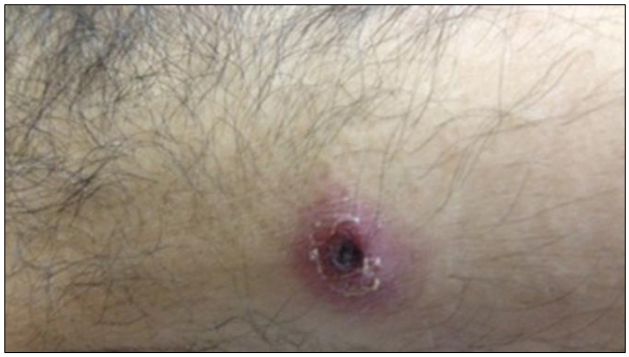

Fig 2

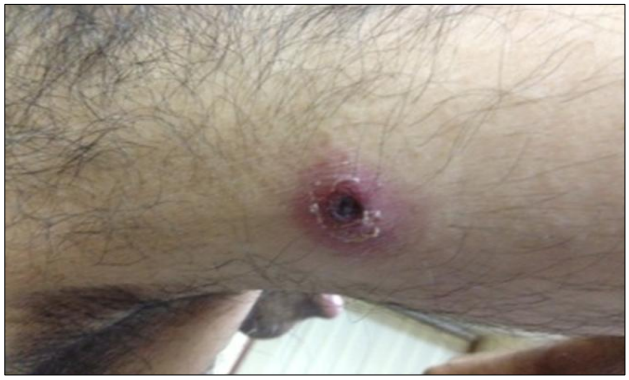

Fig 3

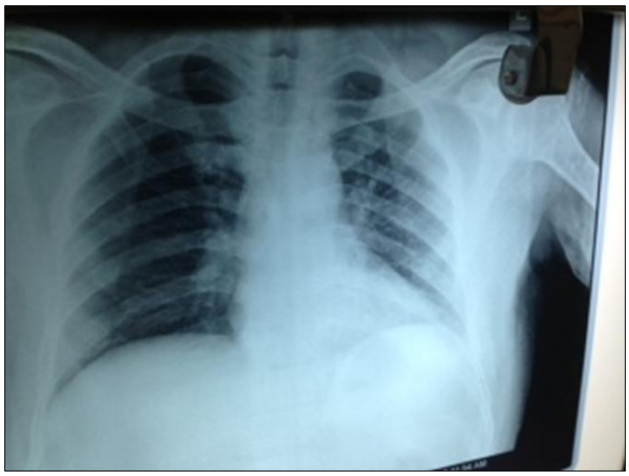

Fig 4

Patient Perspective

The patient was amused, that his profound illness was possibly dealt with indispensably cheap medications (the cost of doxycycline tablets continued to be cheap, till lactobacillus was added to escalate the cost).

That a small insignificant lesion on the skin, can play a role in a life threatening disease.

Acknowledgement

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