STUDY OF DISTRIBUTION OF ESCHARS IN PAEDIATRIC SCRUB TYPHUS PATIENTS AT A TERTIARY CARE HOSPITAL

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ABSTRACT

BACKGROUND

Scrub typhus is caused by an organism related to Rickettsia species *Orientia tsutsugamushi*. It causes a disseminated vasculitis and perivascular inflammatory lesions whose net result is significant vascular leakage and end organ injury, especially brain and lungs. Eschar is the site of inoculation which is painless, non-pruritic and is a useful indicator of the disease. In our study, we included the distribution of eschar in paediatric scrub typhus patients.

MATERIAL AND METHODS

This study was conducted at a tertiary care teaching hospital between June 2013 and November 2015.

AIM OF THE STUDY

The study was done with the aim of studying distribution of eschar on paediatric patients less than 12 years' age group with presence of eschar and who were confirmed to have scrub typhus with a positive one-step scrub typhus antibody test (SD-BIOLINE tsutsugamushi test).

RESULTS

A total of 72 cases with eschar were included in the study. Commonest site of eschar in our study was axilla followed by groin. Other common sites of eschar included head and neck and chest.

CONCLUSIONS

Detection of eschar helps clinically to distinguish scrub typhus from other acute febrile illnesses. Knowledge of common sites of eschar would be useful for early clinical diagnosis of Scrub typhus, especially in endemic areas.

KEYWORDS

Scrub Typhus, Eschar, *Orientia Tsutsugamushi*, Distribution, Paediatric, One Step Scrub Typhus Antibody Test.

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INTRODUCTION

Scrub typhus is an important cause of acute febrile illness in South and East Asia and the Pacific. The causative agent is distinct from but related to Rickettsia species, i.e. *Orientia tsutsugamushi*. *O. tsutsugamushi* is transmitted via bite of a larval stage (Chigger) of a trombiculid mite (*Leptotrombidium*), which serves as both vector and reservoir.¹ Rickettsial infections are re-emerging and are prevalent throughout the world. In India they are reported from Maharashtra, Tamilnadu, Karnataka, Kerala, Jammu and Kashmir, Uttaranchal, Himachal Pradesh, Rajasthan, Assam and West Bengal.² Scrub typhus has been increasingly reported from almost all parts of the country in the recent years.

Scrub typhus can be mild or severe in children. A painless papule occurs at the bite site prior to other disease symptoms that later ulcerates and transforms into a black crust or eschar in a variable proportion of patients, but is a useful indicator of the disease. A single painless eschar with an erythematous rim at the site of chigger bite is seen in 7-68% of cases.^{1,2} Hence, we studied the distribution of eschars in paediatric Scrub typhus patients.

MATERIAL AND METHODS

This study was conducted at King George Hospital, Visakhapatnam, a tertiary care teaching hospital between June 2013 and November 2015 with an aim of studying the distribution of eschar in paediatric patients of less than 12 years confirmed to have Scrub typhus with a positive one-step scrub typhus antibody test (SD-BIOLINE tsutsugamushi test) and presence of eschar.

RESULTS

During the study period, out of 93 paediatric patients less than 12 years who are positive for scrub typhus antibody one-step - SD BIOLINE tsutsugamushi test, a total of 72 patients had an eschar. All cases had single eschar. The distribution of eschars over the body of the patients in our study were shown in the Table 1. Some of our patients with eschar were shown in the

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Figure 1, 2, 3, 4, 5, 6, 7, 8, 9 and 10. In our study, eschar was found in axillary region - 24 patients (33.33%), groin - 16 patients (22.22%), head and neck - 8 patients (11.11%), chest - 6 patients (8.33%), thighs - 6 patients (8.33%), abdomen - 5 patients (6.95%), arms - 3 patients (4.17%), back - 2 patients (2.78%) and legs - 2 patients (2.78%). In our study, the commonest site of eschar was axilla followed by groin and head and neck region.

Site of Eschar	Number of Patients (<12 years)	Percentage (%) (n=72)
Head & Neck	8	11.11
Axilla	24	33.33
Arms	3	4.17
Chest	6	8.33
Back	2	2.78
Abdomen	5	6.95
Groin	16	22.22
Thighs	6	8.33
Legs	2	2.78

Table 1: Distribution of Eschars (Present Study)

A total of 72 cases with eschar turned positive for one-step scrub typhus antibody test were included in the study. Commonest site of eschar was axilla followed by groin. Other common sites of eschar included head and neck and chest.

	Bahubali D Gane Study (2011-2015). ³		Present Study (2013-2015)	
Site of Eschar	No. of Patients (<18 years)	(%) (n=52)	No. of Patients (<12 years)	(%) (n=72)
Head & Neck	2	3.84	8	11.11
Axilla	15	28.84	24	33.33
Arms	1	1.92	3	4.17
Chest	5	9.61	6	8.33
Back	3	5.76	2	2.78
Abdomen	7	13.46	5	6.95
Groin	14	26.92	16	22.22
Thighs	2	3.84	6	8.33
Legs	3	5.76	2	2.78

Table 2: Comparison of Distribution of Eschars

Our study had good correlation with Bahubali D Gane study (2011-2015).³ regarding the common sites of eschar, i.e. axilla and groin regions and other less common sites also.

Fig. 1: Eschar at Axillary Region

Fig. 2: Eschar on Back

Fig. 3: Eschar at Axilla

Fig. 4: Eschar at Lower Abdomen

Fig. 5: Eschar over Back

Fig. 6: Eschar at Upper Abdomen

Fig. 9: Eschar at Gluteal Region

Fig. 7: Eschar over Face Pre-Auricular Region

Fig. 10: Eschar at Axilla

Fig. 8: Eschar at Axilla

DISTRIBUTION OF ESCHARS IN OUR STUDY IN PERCENTAGES (%)

Chart 1

Chart 2

DISCUSSION

A single painless eschar with an erythematous rim at site of the chigger bite is seen in 7-68% of cases, which is a typical feature of scrub typhus and helps in diagnosis of scrub typhus. Areas where skin folds are found and moist areas should be examined for the presence of eschar. An eschar is formed when an infected chigger bites the skin while feeding on human skin. It bites in warm, damp areas like axilla, groin. The organisms multiply at the site of inoculation and form papule, which ulcerates and becomes necrotic and forms a typical black eschar with or without regional lymphadenopathy. An eschar measures around 0.5-20 mm. Eschar may resolve completely in 3-4 weeks with no sequelae or it may cause hyperpigmentation or scarring. Since eschar is a painless lesion, patients may be unaware of it. Humans are accidental hosts. Scrub typhus can be mild or severe in children. Scrub typhus presents as a systemic vasculitis like infection with varied systemic manifestations and complications which include jaundice, meningoencephalitis, myocarditis, interstitial pneumonia leading to ARDS and renal failure. The differential diagnosis includes fever of unknown origin, enteric fever, dengue haemorrhagic fever, leptospirosis, malaria, other rickettsioses and infectious mononucleosis.⁴ Diagnosis is confirmed by isolation of organism in culture or serological tests like IgM capture ELISA, which have a retrospective value but are confirmatory. Other diagnostic tests include indirect fluorescent antibody test. Weil-Felix test and immune-chromatographic tests, PCR and Anti O tsutsugamushi IgM and IgG based rapid diagnostic tests have been developed.^{4,5} These tests are usually unavailable in poor tropical areas. In our study, we have used SD-BIOLINE one-step tsutsugamushi antibody test.⁶ Scrub typhus is very responsive to treatment such as doxycycline or tetracycline. Azithromycin is a good

alternative. Therapy should be continued for a minimum of 5 days and until the patient had been afebrile for 3 days to avoid relapse.

CONCLUSION

Scrub typhus being an important cause of acute febrile illness and many common febrile illnesses such as malaria, dengue, enteric fever are included in the differential diagnosis list and moreover owing to the potential for severe complications, timely diagnosis and decision to initiate empiric treatment should be based on clinical suspicion and detection of eschar. Therefore, the clinician should be aware of the varied presentations of scrub typhus as well as common sites of eschar.⁷ and a thorough search for the presence of eschar especially axillary, groin, head and neck regions and also other atypical sites in all patients presenting as fever of unknown origin in endemic areas helps to differentiate scrub typhus from other illnesses.

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