Scrub typhus- An emerging disease in South India

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ABSTRACT

Background: Scrub typhus is a mite borne Rickettsial disease caused by 'Orientia tsutsugamushi'. It is an emerging disease in India. The clinical manifestations are protean and therefore diagnosis warrants a high index of suspicion.

Aim: To study the clinico epidemiological pattern of Scrub typhus among patients presenting to our hospital.

Methods: All clinically suspected cases of scrub typhus presenting to our hospital over a period of six months were analysed retrospectively.

Results: Forty five patients above the age of twelve years were diagnosed clinically and confirmed by immunochromatography test for IgM antibodies.

Conclusion: Scrub typhus is a re- emerging disease in South India. Early diagnosis and treatment with Doxycycline is highly effective.

Key words: eschar, immunochromatography, doxycycline, Orientia tsutsugamushi

INTRODUCTION

Scrub typhus is a mite borne Rickettsial disease caused by 'Orientia tsutsugamushi'. It is distributed throughout Asia Pacific, being endemic in Korea, China, Taiwan, Japan, Pakistan, India, Thailand, Malaysia and northern parts of Australia.[1] Scrub Typhus often presents as fever, headache, myalgia which is clinically indistinguishable from other endemic diseases such as typhoid, leptospirosis and dengue. Eschar is a useful indicator of the disease but of variable rate of occurrence.[2,3,4,5] Clinical presentations vary from a subclinical infection to a severe illness with systemic involvement and associated with increased morbidity and mortality in untreated cases. Diagnosis depends on a high index of clinical suspicion and laboratory confirmation. There has been a sudden spurt of cases reporting to our hospital, with about 45 cases diagnosed within a period of 6 months, tested positive by serology and responded dramatically to oral doxycycline.

MATERIALS AND METHODS

The paper is a retrospective study of patients with Scrub typhus admitted to our hospital. The study group included patients aged more than 12 years admitted to the medical wards of Sri Manakula Vinayagar Medical College Hospital, a tertiary care hospital situated in a rural area of Puducherry, over a period of six months (Sept' 2012-Feb'2013).All the patients admitted with history of fever and/or headache, myalgia of more than three days duration were evaluated for Scrub typhus after ruling out Dengue, Leptospirosis, Malaria and Enteric fever by serology, peripheral smear and blood culture as appropriate.

The other investigations carried out include complete blood counts, Liver function test and renal profile. Chest X-ray, urine culture, blood gas analysis, Hepatitis markers (IgM HAV, HBsAg, HCV antibodies), ultrasonogram of the abdomen were done in indicated cases. A rapid immunochromatography assay for detection of IgM/IgG antibody against Orientia tsutsugamushi antigen in the clinically suspected cases after ruling out other possible causes by relevant investigations was used. Five adult volunteers who had been healthy in the past one month and also confirmed cases of dengue (n=2), typhoid (n=2) and malaria (n=1) as controls were included to validate the test. None of the control tested positive for antibodies to Orientia tstsugamushi.

RESULTS

Forty five patients in the age range of 13-71 years,

predominated by females, directly or indirectly engaged with agriculture; majority from adjoining areas of Tamilnadu were tested positive for IgM/ IgG antibodies to Orientia tsutsugamushi.

The common symptoms include fever (100%) with chills and rigors (66%), myalgia (95%), cough (40%), nausea, vomiting (28%) abdominal pain (13%) and dysuria(6%).The signs noticed were eschar (4%),lymphadenopathy(4%),hepatomegaly(3%), splenomegaly(3%), rash(3%) and hypotension(11%) and eschar (4%) which is a useful sign is of variable occurrence and has to be differentiated from anthrax and other Rickettsial infections. It initially starts as a papule at the site of infection (Fig: 1a) and progresses to central necrosis (Fig1b) and eschar (Fig:1c). Macular rash appears towards the end of first week of illness over the trunk (Fig 2). It may become papular and may extend to the arms and legs. Eschars are reported to be more frequent in primary infections and less often seen in secondary infections.

Fig. 1a.Papulular stage of an eschar

Fig.1b. showing central necrosis

Fig.1c. Eschar over the neck

There was no significant CNS involvement in the affected patients. Mucosal Bleeding in the form of bleeding gums, mild upper gastrointestinal bleed and subconjunctival haemorrhage and was seen in (6%) of patients.

Fig.2.Showing subconjunctival haemorrhage

The blood counts showed leucopenia in 17 (37%) cases and leucocytosis in 02 (4%) cases. Thrombocytopenia was noted in 38 (84%) patients. Elevation of AST, ALT up to 10 times normal was noted in 9 (20%) patients. Renal failure was noted in 4(8%) patients and ARDS in 2(4%) patients, requiring support of ventilator. Complications of scrub typhus noted in our patients are respiratory distress, ARDS, renal failure, shock requiring dopamine support in three patients, fluid replacement alone in the rest and severe thrombocytopenia with mucosal bleeding in 3 patients.

DISCUSSION

Scrub typhus is an important cause of acute undifferentiated febrile illness.[6] It is manifested clinically by high fever, intense headache, diffuse myalgia, and in some patients as rash and eschar at the site of chigger bite. Severe infections may be manifested by interstitial pneumonia, pulmonary edema, congestive cardiac failure, dysfunction of the central nervous system and death.

Delay in diagnosis and treatment can result in severe complications such as acute respiratory distress syndrome, septic shock and multisystem organ failure. Several reports from different parts of India suggest that there is a resurgence of the disease with increased morbidity and mortality.[7,8] Most of the patients present with history of fever of about 1 week or more with myalgia, headache and other features of systemic involvement clinically resembling Dengue, Leptospirosis, Malaria and typhoid fever. It is therefore a disease more of exclusion and laboratory confirmation. All the patients were from rural areas involved in agricultural activities or lived near fields.

Eschar, a useful sign is of variable occurrence and has to be differentiated from anthrax and other Rickettsial infections. It was observed in 4% of cases which are reported to be more frequent in primary infections and less often seen in secondary infections. The bleeding episodes were attributed to superficial mucosal haemorrhage, multiple erosions and vascular etiology by Kim et al.[9] Mucosal bleeding in the form of bleeding gums, upper gastro intestinal bleeding, , sub conjunctival haemorrhage were noted.

Laboratory parameters showed leucopenia,

leucocytosis and thrombocytopenia. Five patients had hypotension. Severity of illness is due to multiple factors like virulence of the infecting strain, host factors and nutritional status.[10]

Five patients selected at random who tested positive by immununochromatography were also tested by IgM ELISA for Scrub typhus infection and found to be positive. All the patients who tested positive had a good clinical correlation, supportive laboratory findings and a dramatic response to treatment with doxycycline. One of our patients responded with addition of Azithromycin.

The oldest test used to diagnose scrub typhus, The Weil-Felix test is the most economical but lacks sensitivity and specificity.[11] The indirect florescent antibody test, the reference standard is more sensitive but expensive and requires fluorescent microscope and expertise. The rapid immunochromatography assay used in our study uses major surface protein 56 KDa antigen of O. tstsugamushi (Karp, Kato,Guilliam). This test has a sensitivity of 99% and specificity of 96%.This test has been compared with a traditional IFA by a study from China[12] and found to be more sensitive and suitable for use in developing countries.

CONCLUSION

It is concluded that a high index of clinical suspicion is required for diagnosis of scrub typhus due to varied clinical presentations. Rapid Immunochromatography tests based on detection of specific antibodies is a useful laboratory aid in the diagnosis. Doxycyclin results in a dramatic improvement in a majority of the patients.

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