Acute Reversible Hearing Loss in Scrub Typhus

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Abstract
Scrub typhus usually presents as pyrexia with or without multiple organ involvement. Acute hearing loss occurs in about one third of cases and is a useful clue toward the diagnosis. We present two cases of scrub typhus with acute reversible hearing loss from an endemic area. The diagnosis was confirmed by nested PCR. ©

INTRODUCTION

Scrub typhus is a zoonosis of rural Asia and the western Pacific islands. The causative organism, Orientia tsutsugamushi, is transmitted to human beings by the bite of a larval Leptotrombidium mite (chigger). Human beings usually get infected when they accidentally encroache upon an area of infected chiggers mainly in rural and sub-urban areas. The mortality due to this disease is 7-30%. Scrub typhus should be differentiated from malaria, arbovirus infections, leptospirosis, meningococcal disease, typhoid, infectious mononucleosis and HIV. Weil-Felix test being performed in many developing countries is not a sensitive test.¹ Microimmunofluorescence (MIF) assay and PCR (Polymerase Chain Reaction) are diagnostic. These tests are not available commercially and are available only in small number of research centers. When available, results are available by PCR within few hours of testing. The outer membrane protein is the major immunodominant antigen present on the surface of O. tsutsugamushi. The 483 bp amplicon for the detection of O. tsutsugamushi is obtained by targeting primers at a truncated portion of the 56kDa outer membrane protein gene.² Scrub typhus has been reported from many parts of India and the vector species, carrying O. tsutsugamushi have also been documented.² Recently the presence of scrub typhus was confirmed in Himachal Pradesh by MIF and PCR with documentation of new genotypes.³

CASE REPORT 1

A 37 years female from rural background, presented with high grade, intermittent, fever associated with severe headache and bodyaches of 17 days duration and was treated with Inj ceftriaxone 1 gm BD for 3 days at local hospital. There was history of passing loose watery stools for 5 days. She experienced tinnitus after 8 days of onset of fever which continued for 5 days followed by progressive difficulty in hearing over next 4 days. She was regularly visiting fields for open air defecation before onset of fever. On examination, she was febrile with dehydration and congested eyes. Large tender lymph nodes were present in left axillary and inguinal regions. One eschar was noted on left breast (Fig. 1) and another eschar was seen on lateral aspect of left leg (Fig. 2). Rest of general physical examination was normal. On systemic examination, she was conscious, responding to commands slowly, speech was slurred, tremors were present and hepatosplenomegaly was noted. Rest of systemic examination including otoscopy was normal. Keeping in view the presence of eschars and prevalence of scrub typhus in region, she was admitted and empirically treated with doxycycline 200 mg OD day after collecting blood and urine for culture and Inj ceftriaxone 1 gm BD was continued. Anticoagulated blood was also preserved for performing nested PCR.

Investigations showed Hb, 8.5 gm%, TLC, 10200 with normal platelet count. Liver and renal function tests were normal but proteinuria was noted. Widal, peripheral smear for malarial parasite, X-ray chest, blood and urine culture all were negative. Weil-Felix tests performed at admission and repeated after one week, were negative. There was good response to therapy and patient was afebrile and fully conscious after 48 hours of starting the treatment. Seven days therapy was completed with both antibiotics. Slurring of speech and tremors improved over next one week. The hearing loss progressively increased till 5 days following admission then started improving gradually. On discharge of patient from hospital on 10th day of admission she was still experiencing difficulty in hearing which improved over next one week followed by tinnitus for another 3 days. On follow up visit after two weeks of discharge...
from hospital, she had fully recovered.

**CASE REPORT 2**

A forty years old farmer presented with high grade fever, chills and rigors, headache and body aches of 10 days duration. He experienced progressive hearing loss for 3 days. On examination, mild jaundice, congested eyes, generalized lymphadenopathy and an eschar in left axilla were present. Rest of systemic examination was normal. He was treated empirically with doxycycline 200 mg OD after preserving anticoagulated whole blood for PCR. Hemogram was normal, widal, peripheral smear for malarial parasite; X-ray chest, blood and urine culture all were negative. Weil-Felix test was also negative. Total serum bilirubin was 3.8 mg %, SGOT, SGPT and alkaline phosphatase were 266, 295 and 454 IU respectively. The patient was afebrile after 24 hours of therapy and was discharged on completion of 7 days therapy with doxycycline. His hearing started improving after 5 days of admission to hospital and he was fully recovered over next two weeks.

**PCR**

DNA was extracted from the EDTA anticoagulated blood samples using blood genomic DNA kit (Sigma) as per the manufacturer’s instructions. A nested PCR was performed as per Furuya et al 1993 and a band of 483 bp was observed in the samples when the PCR products were observed using the Image Master VDS gel documentation system (Pharmacia Biotech, USA).

**DISCUSSION**

The clinical and laboratory features of scrub typhus are notoriously nonspecific. 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 under the axilla. An eschar forms at the bite site in about half of primary infections which begins as a small papule, enlarges, undergoes central necrosis, and acquires a blackened crust to form a lesion resembling a cigarette burn. A transient maculopapular rash that predominates on the trunk may appear at the end of the first week of illness but it is often difficult to see. The fever starts abruptly and has the usual typhus accompaniments of suffused conjunctivae and face, severe headache, drowsiness, apathy, pain in shins and other muscles and more characteristically, generalised lymphadenopathy and hepatosplenomegaly. Other symptoms may include nausea and vomiting, constipation, cough, epistaxis, tinnitus and hyperacusis followed by deafness. In small proportion of cases, tremors, delirium, nervousness, slurred speech, nuchal rigidity may develop in the second week of illness. Hearing loss concurrent with fever is reported by as many as one third of patients and is a useful diagnostic clue. Other complications include
pneumonitis, myocarditis, vasculitis, encephalitis and acute renal failure.\textsuperscript{1,3,5-6} During a recent outbreak of scrub typhus in Sri Lanka; 19\% of patients presented with fever and altered hearing of acute onset.\textsuperscript{7} The presence of unilateral or bilateral deafness may occur in many rickettsial diseases and mechanism for hearing loss has been assumed to be vasculitis-induced cochlear damage however it could be immune mediated also.\textsuperscript{8}

The awareness regarding presence of scrub typhus in this region and presence of eschar prompted us to start doxycyclin in these patients and saved them of further complications.

The presence of acute hearing loss in cases of ‘Pyrexia of Unknown Origin’ should arouse strong suspicion of scrub typhus in endemic areas and empirical therapy with doxycycline should be considered.

REFERENCES

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