

Case Report

Bilateral sudden sensorineural hearing loss in a patient with scrub typhus: a case report

Mosin Babu*, Thingbaijam Sudhiranjan Singh, Shandhyalata Yumlembam,
Nimitha A. M. Juhy, Shapam Ravi Meetei

Department of Otorhinolaryngology, Regional Institute of Medical Sciences, Imphal, Manipur, India

Received: 05 October 2021

Accepted: 02 November 2021

*Correspondence:

Dr. Mosin Babu,

E-mail: mosinbabu1992@gmail.com

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ABSTRACT

Scrub typhus is a febrile illness caused by *Orientia tsutsugamushi*, a gram negative alpha proteobacterium and transmitted by the bite of lepto-trombidium, chigger mite larvae. The disease is endemic to Southeast Asia and Northern Australia and derives its name from the vegetation that harbours the mite. The patient usually presents with high-grade fever, an eschar at the inoculation site, generalised lymphadenopathy, organomegaly and pneumonitis. Rarely, the patient may go into acute renal failure, disseminated intravascular coagulation and shock. A case of scrub typhus presenting with acute sensorineural hearing loss which resolved with treatment is being reported. Hearing impairment with fever in a patient in endemic region of scrub typhus can give a clue to health care worker towards the diagnosis of scrub typhus and thus early administration of treatment.

Keywords: Sensorineural, Hearing loss, Scrub typhus, *Orientia tsutsugamushi*

INTRODUCTION

Scrub typhus is an acute febrile infection transmitted by the bite of lepto-trombidium, chigger mite larvae.¹ The causative organism is *Orientia tsutsugamushi*, a gram negative alpha proteobacterium.² It is an obligate intracellular parasite. The organism spreads throughout the body through the haematogenous and lymphatic route with the patient manifesting with a wide variety of signs and symptoms- high-grade fever, myalgia, eschar at the inoculation site, generalised lymphadenopathy and organomegaly.³ Data compiled in a study from northwest India shows the occurrence of pathognomonic eschar in 4–46% patients with Scrub typhus.⁴ Serious complications of scrub typhus are not uncommon and may be fatal; they include pneumonia, myocarditis, meningoencephalitis, acute renal failure and gastrointestinal bleeding.⁵

Hearing loss has been documented as a rare complication of scrub typhus. Bilateral sudden sensorineural hearing

loss (SNHL) is an extremely rare presentation.⁶ However, studies conducted in Sri Lanka have reported sensorineural hearing loss in 19% of serologically diagnosed cases of scrub typhus.⁷

Globally, over one billion people are at risk for scrub typhus and an estimated one million cases occur annually. This disease is also prevalent in areas such as sandy beaches, mountain deserts, and equatorial rain forests. Certain areas such as forest clearings, riverbanks, and grassy regions provide optimal conditions for the infected mites to thrive.⁸

We hereby report a patient who presented with undifferentiated febrile illness and bilateral sensorineural hearing loss (SNHL). She was finally diagnosed as having scrub typhus and her illness and SNHL recovered with empirical treatment.

CASE REPORT

An 18-year old female patient from Tamenglong district of Manipur, India presented at the outpatient department (OPD) of Regional Institute of Medical Sciences, Imphal, Manipur, India with complaints of high grade continuous fever for the past 10 days associated with chills and rigor. She also complained of decreased hearing in both ears for the past 3 days.

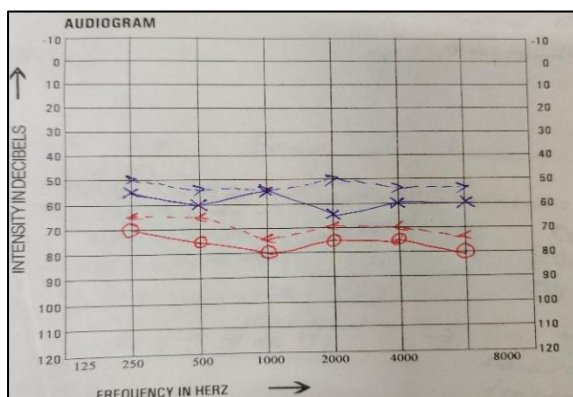


Figure 1: Pure tone audiometry (day 1) showing severe SNHL in right ear and moderately-severe SNHL in left ear.

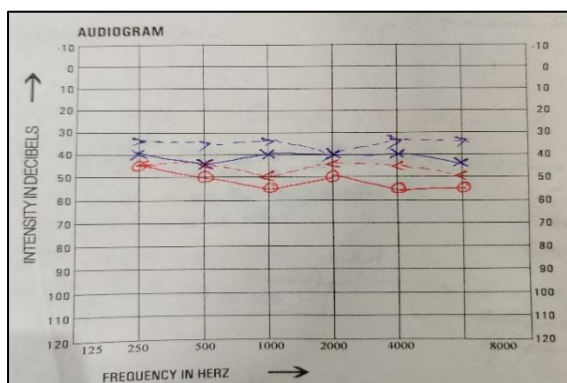


Figure 2: Pure tone audiometry (day 7) showing bilateral moderate SNHL.

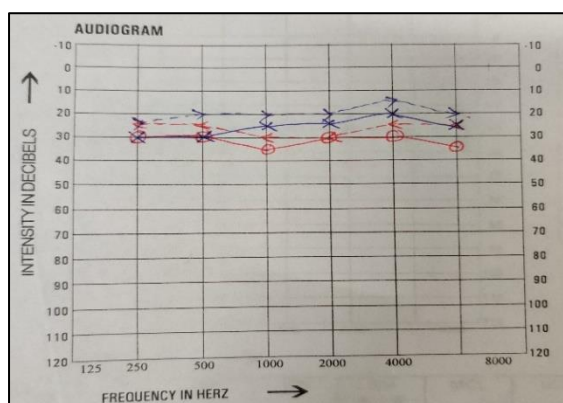


Figure 3: Pure tone audiometry after one month showing bilateral mild SNHL.

It was associated with headache and multiple episodes of vomiting. She gave a history of insect bite behind left ear 15 days before the onset of fever. No history of any rash, arthralgia, myalgia, bleeding from any site, visual disturbance. There was no complaint of ear fullness, earache, ear discharge, tinnitus. She was not received any ototoxic drugs (aminoglycoside or loop diuretic). There was also no history of cardiovascular, respiratory, gastrointestinal, or genitourinary complaints.

On examination, the patient was conscious, oriented to time place and person. She had tachycardia (110/min), raised body temperature (100.5OF), normal blood pressure (110/74 mmHg) and normal respiratory rate (20/min). There was no lymphadenopathy, eschar, neck rigidity, and elevated jugular venous pressure. Systemic examination revealed no abnormality. Oscopic examination was normal.

Her investigations revealed neutrophilic leucocytosis, low platelet count (102,000/mm³), raised erythrocyte sedimentation rate (110mm at the end of first hour) and raised serum aminotransferases (AST- 234 IU/L, ALT-196 IU/L). Peripheral smear for malarial parasite and dengue serology were negative and urine routine examination was normal. Her chest radiograph and abdominal ultrasound did not reveal any abnormality. Cerebrospinal fluid (CSF) study and kidney function tests were normal. Her pure tone audiometry (PTA) test was performed which revealed severe SNHL in right ear and moderately-severe SNHL in left ear. The auditory threshold was reduced to 77 dB in the right ear and 60 dB in the left ear (Figure 1). Enzyme Linked Immunosorbent Assay was performed on the serum for IgM antibodies for *Orientia tsutsugamushi* which came out to be positive.

The patient was treated with oral doxycycline at a dose of 100mg twice daily for 14 days and oral prednisolone at a dose of 1 mg/kg/day for 7 days. Her fever subsided and hearing loss recovered partially which was confirmed by repeat PTA performed seven days later showing an auditory threshold of 52 dB in right ear and 43 dB in left ear (Figure 2). Subsequently, she was further followed up after one month with PTA which showed further improvement (Figure 3).

DISCUSSION

Rickettsial diseases are prevalent throughout the world. Areas such as riverbanks and forest clearings provide optimal conditions for the organism to thrive. The disease is quite prevalent in India, more commonly in the Himalayas, although specific data are not available. The clinical features of scrub typhus are non-specific fever, eschar at the site of bite, lymphadenopathy, organomegaly. Complications such as pneumonitis, myocarditis, encephal meningitis and acute renal failure have been frequently reported.⁶

Hearing impairment in scrub typhus is a rarely encountered entity in clinical practice. Furthermore, sudden bilateral SNHL is an extremely rare presentation. Auditory disturbances in the form of otalgia and tinnitus have been reported.⁹

Although the mechanism of hearing loss in scrub typhus has not yet been fully elucidated, at least two mechanisms have been proposed. In the first, the Rickettsiae directly invade the central nervous system and induce vasculitis in the acute stage and damage the cochlear division of the eighth cranial nerve. In the second, vasculitis is produced in the vasa vasorum of the cochlear nerve by a secondary immune mechanism.¹⁰⁻¹²

Friedmann et al described the characteristic histopathological features in scrub typhus.¹³ The VIII nerve showed multiple typhus nodules and there was extensive interstitial neuritis of the VIII nerve and demyelination of the nerve fibers.

In a study conducted by Premaratna et al in Sri Lanka, six out of 32 patients of scrub typhus had reported auditory symptoms out of which three had deafness (type of deafness was not characterized).⁷ They also reported that the deafness appears in the second week of the disease.

In our patient, hearing loss was reported around the 8th day of the disease. The patient showed improvement in the hearing thresholds after seven days and subsequently after one month with the administration of oral doxycycline and oral corticosteroids. Although the definitive pathology of SNHL is not known, prompt institution of antirickettsial therapy, corticosteroids, early diagnosis of complications are crucial for achieving good clinical outcomes.

CONCLUSION

Bilateral sudden sensorineural hearing loss is a very rare complication of scrub typhus that is generally reversible with empirical treatment. It should be considered as one differential diagnosis in any patient who presents with acute febrile illness and ear symptoms like hearing loss without any otoscopic abnormality.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: Not required

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Cite this article as: Babu M, Singh TS, Yumlembam S, Juhy NAM, Meetei SR. Bilateral sudden sensorineural hearing loss in a patient with scrub typhus: a case report. *Int J Otorhinolaryngol Head Neck Surg* 2021;7:1957-9.