

## Case Report

# Scrub Typhus with Bilateral Sensorineural Hearing Loss: A Rare Presentation

Athulya Asokan<sup>1</sup>, Athira V R<sup>2</sup>, Sanal K Thomas<sup>3</sup>, Ajeesh Koshy<sup>4</sup>

<sup>1</sup>Assistant Professor, General Medicine, Government Medical College, Kottayam.

<sup>2</sup>Senior Resident, <sup>4</sup>Assistant Professor, General Medicine, Pushpagiri Institute of Medical Sciences.

<sup>3</sup>Senior Resident, Neurology, Jubilee Mission Medical College.

DOI: <https://doi.org/10.24321/0019.5138.202403>

## I N F O

### Corresponding Author:

Athulya Asokan, Government Medical College, Kottayam.

### E-mail Id:

athulyaroopak@gmail.com

### Orcid Id:

<https://orcid.org/0000-0001-9146-9717>

### How to cite this article:

Asokan A, Athira V R, Thomas S K, Koshy A. Scrub Typhus with Bilateral Sensorineural Hearing Loss: A Rare Presentation. J Commun Dis. 2024;56(1):13-15.

Date of Submission: 2024-02-13

Date of Acceptance: 2024-03-01

## A B S T R A C T

Scrub typhus, caused by *Orientia tsutsugamushi*, is a re-emerging infectious disease prevalent in Southeast Asia, including India. While commonly presenting with fever and systemic complications, neurological manifestations such as sudden bilateral sensorineural hearing loss (SNHL) are rare but increasingly recognised. We report a case of a 64-year-old female presenting with fever, myalgia, and bilateral SNHL, later diagnosed with scrub typhus. Diagnostic challenges arise due to the diverse clinical spectrum and nonspecific symptoms. The proposed mechanisms for hearing loss involve direct invasion of the central nervous system or vasculitis of the cochlear nerve. Heightened awareness among healthcare providers is crucial for timely diagnosis and management. Empirical treatment with doxycycline is recommended in endemic regions for suspected cases. This case emphasises the importance of considering scrub typhus in patients with acute febrile illness and otic symptoms, facilitating early intervention and improved outcomes.

**Keywords:** Scrub Typhus, *Orientia tsutsugamushi*, Bilateral Sensorineural Hearing Loss, Vasculitis, Doxycycline

## Introduction

*Orientia tsutsugamushi* (formerly known as Rickettsia) transmits scrub typhus, an infectious disease that affects humans. *Leptotrombidium deliense* and *Leptotrombidium akamushi* are species of chiggers, which are mites in the Trombiculidae family that transmits the disease. It is the most widespread re-emerging rickettsial infection in India and other Southeast Asian nations.<sup>1</sup> Humans are the accidental hosts. Manifestations vary from mild self-limiting febrile illness to severe life-threatening illness aggravated by acute respiratory distress syndrome (ARDS), multisystem failure, myocarditis, encephalitis, etc.<sup>2</sup> The multitude of manifestations associated with this condition

pose diagnostic challenges. The occurrence of an acute febrile illness with multisystem involvement in an endemic area should trigger consideration of a potential rickettsial disease.

Patients infected with *Rickettsia rickettsii* (*R. rickettsii*), *R. typhi*, or *R. conorii* rarely develop a sensory neural type of hearing loss.<sup>3,4</sup> We report a case of a patient who initially presented with a febrile illness, later developed hearing loss, and was ultimately diagnosed with scrub typhus.

## Case Report

A 64-year-old female, employed as a manual labourer in a semi-urban area, sought medical attention at a tertiary care hospital in South Kerala. She reported a three-day history

of fever, myalgia, and bilateral hearing loss accompanied by tinnitus. There were no complaints of ear fullness, earache, or ear discharge. There was no history of rash, arthralgia, myalgia, eschar, visual disturbance, or ear trauma. Additionally, there were no other notable systemic complaints. Her medical history revealed a diagnosis of type 2 diabetes two years prior. She did not report any other significant medical issues.

During the examination, she was conscious and oriented, with a fever (temperature: 102 °F), while the rest of her vital signs were within normal ranges. Rinne’s test yielded positive results on both sides, and an evaluation of Weber’s test was unfeasible. Both sides exhibited decreased values on the Air-Bone-Conduction (ABC) test. Other system examinations revealed normal findings, and the otoscopic examination showed no abnormalities.

The healthcare provider provisionally diagnosed the patient with acute vestibular neuritis due to the sudden onset of hearing loss accompanied by fever. The initial investigations revealed normal leucocyte counts with neutrophil predominance, elevated GRBS values (245 mg/dl) and hypoalbuminemia with a reversal of the albumin globulin (A/G) ratio. The urine routine examination findings were normal, and the chest radiograph revealed no abnormalities. The patient was initially admitted to the ENT department and received symptomatic treatment. However, on the

second day of admission, hypotension developed. An arterial blood gas (ABG) test indicated metabolic acidosis, and her procalcitonin levels were elevated (34 ng/mL). The medical team promptly transferred her to the ICU with an initial impression of sepsis/ diabetic ketoacidosis, initiated intravenous antibiotics (ceftriaxone), and administered intravenous fluids to correct hypotension. Serum ketones were negative and urine/ blood cultures and sensitivity (C&S) reports did not reveal any growth.

A patient exhibiting fever, hypotension, and elevated procalcitonin raised the possibility of viral/ leptospiral myocarditis. A 2D echocardiogram showed normal findings, and Leptospira IgM was negative.

Audiologists conducted an assessment, revealing a pure tone audiogram that indicated bilateral moderate to profound severe sensorineural hearing loss (Figure 1).

After reviewing all the available history, examination, and investigations, considered the possibilities of acute febrile illness and bilateral sensorineural hearing loss and deemed scrub typhus a potential diagnosis.

The scrub typhus IgM test returned positive. Treatment commenced with tab. doxycycline, leading to symptom improvement with no further fever spikes noted. Upon follow-up, there was a marginal improvement in her hearing impairment.

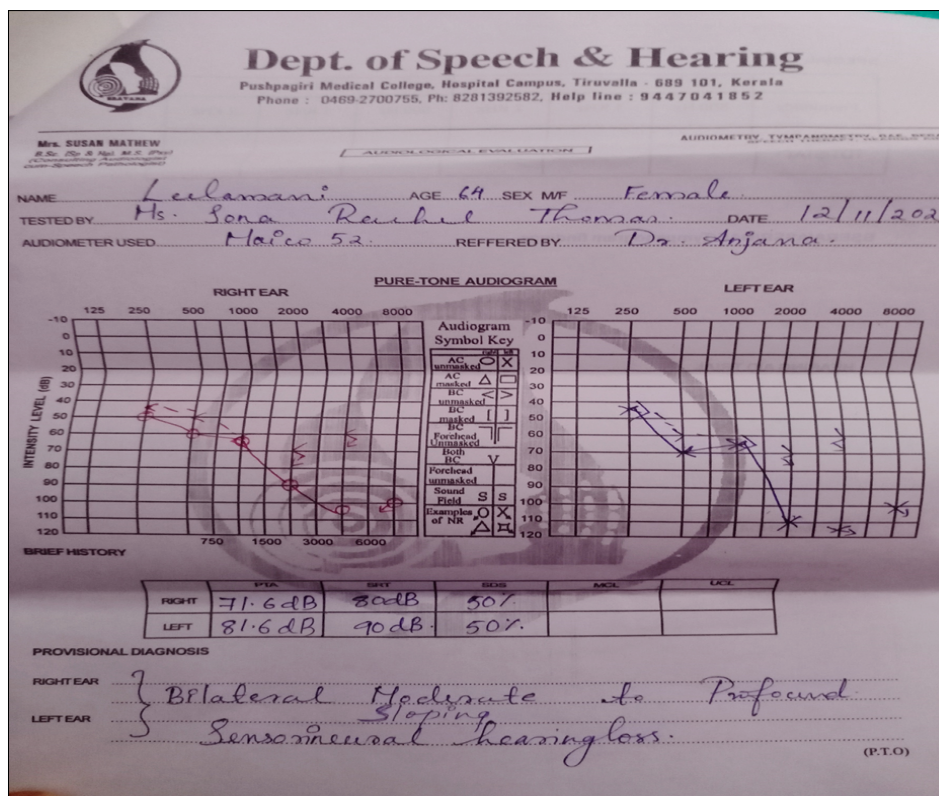


Figure 1. Pure Tone Audiogram Report Depicting Sensorineural Deafness

## Discussion

Scrub typhus cases have increased in the southern region of India over the past ten years.<sup>5</sup> The spectrum of nervous system complications linked with scrub typhus ranges from aseptic meningitis to meningoencephalitis, alongside rare instances of sudden bilateral sensorineural hearing loss (SNHL), and other auditory issues like otalgia and tinnitus, typically emerging in the second week of illness. Acute bilateral sensorineural hearing loss (SNHL) is a rare presentation. Auditory disturbances, such as otalgia and tinnitus, have been reported, typically appearing during the second week of illness.<sup>6</sup> Patients infected with *Rickettsia rickettsii*, *R. typhi*, and *R. conorii* have infrequently reported experiencing sensorineural hearing loss.<sup>7</sup>

The two proposed mechanisms explaining the involvement of the vestibulocochlear nerve in scrub typhus-related hearing loss include direct invasion of the central nervous system by the bacterium, causing vasculitis and subsequent damage to the cochlear nerve. The second mechanism proposes vasculitis of the vasa vasorum of the cochlear nerve due to a secondary immune reaction. These proposed mechanisms offer insights into the pathophysiology of scrub typhus-associated auditory complications, providing a basis for improved understanding and management of the disease's neurological aspects.<sup>8</sup>

The discussion underscores the importance of heightened awareness among healthcare providers regarding potential neurological complications of scrub typhus, including hearing impairments, to enable timely diagnosis and effective treatment strategies.

## Conclusion

Any acute febrile illness with multisystem involvement in an endemic area warrants suspicion of rickettsial disease. Scrub typhus should be considered as a potential differential diagnosis in patients presenting with acute febrile illness and otic symptoms, such as hearing loss, even in the absence of otoscopic abnormalities. In endemic regions, empirical treatment with doxycycline is deemed appropriate.<sup>9</sup>

**Source of Funding:** None

**Conflict of Interest:** None

## References

1. Chakraborty S, Sarma N. Scrub typhus: an emerging threat. Indian J Dermatol. 2017 Sep-Oct;62(5):478-85. [PubMed] [Google Scholar]
2. Choi YS, Song SY, Kim YD, Bae CH. A case of scrub typhus with bilateral sudden hearing loss. Korean J Otorhinolaryngol Head Neck Surg. 2013;56(11):738. [Google Scholar]
3. Dixit J, Jadon RS, Ray A, Ranjan P, Vikram NK, Sood R. Scrub typhus with bilateral sensorineural hearing loss: a unique case report. J Vector Borne Dis. 2020;57(1):101-3. [PubMed] [Google Scholar]
4. Silpapojakul K, Ukkachoke C, Krisanapan S, Silpapojakul K. Rickettsial meningitis and encephalitis. Arch Intern Med. 1991;151(9):1753-7. [PubMed] [Google Scholar]
5. Stephen S, Sangeetha B, Ambrose S, Sarangapani K, Gunasekaran D, Hanifah M, Somasundaram S. Outbreak of scrub typhus in Puducherry & Tamil Nadu during cooler months. Indian J Med Res. 2015 Nov;142(5):591-7. [PubMed] [Google Scholar]
6. Premaratna R, Chandrasena TG, Dassayake AS, Loftis AD, Dasch GA, de Silva HJ. Acute hearing loss due to scrub typhus: a forgotten complication of a reemerging disease. Clin Infect Dis. 2006;42(1):e6-8. [PubMed] [Google Scholar]
7. Sexton DJ. Acute hearing loss and rickettsial diseases. Clin Infect Dis. 2006;42(10):1506. [PubMed] [Google Scholar]
8. Varghese GM, Abraham OC, Mathai D, Thomas K, Aaron R, Kavitha ML, Mathai E. Scrub typhus among hospitalized patients with febrile illness in South India: magnitude and clinical predictors. J Infect. 2006;52(1):56-60. [PubMed] [Google Scholar]
9. Vivekanandan M, Mani A, Priya YS, Singh AP, Jayakumar S, Purty S. Outbreak of scrub typhus in Pondicherry. J Assoc Physicians India. 2010 Jan;58:24-8. [PubMed] [Google Scholar]