



Letter to the Editor

Health emergency with recent surge of scrub typhus alongside other infectious diseases in India with Odisha in focus: Suggested mitigation measures and preparedness of public healthcare infrastructure

Dear Editor,

Scrub typhus is in focus after numerous recent deaths in India, and the Sundergarh district of Odisha, India has reported the latest scrub typhus death cases. Odisha is reeling under two simultaneous disease outbreaks recently, leptospirosis on one hand and scrub typhus on the other. Leptospirosis is a critical bacterial human and animal disease with symptoms of headache, rashes, red eyes, high fever, chills, abdominal pain, vomiting, and diarrhea, similar to the scrub typhus symptoms [1]. In the absence of a proper timely treatment, it could distress respiration, damage the kidney, harm the liver, or lead to meningitis, ultimately leading to even death. As both microbial diseases manifest almost similar initial pathological symptoms, their timely diagnosis and follow-up treatment remain a challenge for the clinician on the job. The scenario further complicates the situation due to the fact that any misdiagnosis or late medical intervention could be fatal to the patient in either case. Eight scrub typhus deaths are confirmed in two districts of Odisha. The affected cases are being increasingly reported from particularly four districts of Odisha, Kalahandi, Bargarh, Sundargarh, and Keonjhar. In the state, Sundargarh reports more than 200 scrub typhus cases while 630 cases are reported from Keonjhar this year. The district Sundargarh also reported 322 dengue cases, which put further burden on the health department. However, no co-infection has been reported in the district yet. Scrub typhus cases are also on the rise in other Indian states Rajasthan, Himachal Pradesh, and Maharashtra, with 1177, 370, and 16 corresponding cases. In similar lines, scrub typhus cases are also reportedly increasing alongside dengue and flu in Telangana. A combined flu, scrub typhus, or typhoid cases alongside dengue complicate healthcare initiatives, especially among children, the immunocompromised, and the elderly.

Scrub typhus is overlooked as a public health issue in India. Although treated as a neglected disease, scrub typhus as a rickettsial infection reemerges as life-threatening that account for a million cases on an annual basis. Symptoms of scrub typhus beginning around the tenth day of infection/parasite-bitten include fever, headache, body aches and gastrointestinal symptoms, sometimes with rashes [2]. Further, peri-vascular inflammation, disseminated vasculitis and vascular leakage are noticed that could injure the internal organs significantly. Combined acute respiratory distress syndrome, acute hepatic and renal failure, myocarditis, vasculitis shock and encephalitis as multiple organ dysfunction syndromes are commonly observed in a severe case of scrub typhus infection. A high mortality up to 30 % could occur with delayed treatment in such a scenario [3]. It is presented without eschar (dead tissue over a healthy skin that sheds over time) at times with only flu-like symptoms. This may confuse with other acute febrile illnesses. Preterm deliveries in scrub typhus-infected pregnant women, miscarriages and

premature babies with reduced gestational age, and neonatal deaths in severe cases have been reported.

Scrub typhus cases may primarily be treated in adults by orally administering 200 mg of doxycycline (tetracycline) once and 100 mg twice daily until symptoms improve. Chloramphenicol and macrolides are also reportedly effective. Although a patient starts feeling better within 48 hours of treatment in most cases, completing the prescribed antibiotics course is advisable. Combination therapy with intravenous doxycycline and azithromycin, instead of monotherapies of either drug, is lately suggested as a better and more effective way to treat severe scrub typhus. Ensuring adequate stock of drugs, the health department in Odisha has instructed clinicians to prescribe apt antibiotics. Antibiotics that are usually prescribed to treat scrub typhus are tetracycline, azithromycin, doxycycline, and rifampicin. Doxycycline may work in 24–48 hours and is hence considered the most effective. A patient treated early with doxycycline usually recovers early. Azithromycin may be recommended selectively for the pregnant.

Frequent visitors to the farmlands or forests are susceptible to scrub typhus. Scrub typhus infection may be confirmed through serological tests. Scrub typhus can be detected through ELISA available in hospitals across all district headquarters in Odisha. Odisha government instructs the concerned health establishments to enhance their surveillance of scrub typhus and leptospirosis, especially during the seasonal upsurge. They have also been instructed that procurement and supply of testing kits and the testing facilities in the district public health laboratories are ensured, the doctors and healthcare workers are sensitized about the tests in case of PUO (pyrexia of unknown origin), and public awareness and early diagnosis are increased. As per the health officials of Sundargarh District, a special team of clinicians was pressed into service to attend to the scrub typhus patients. However, the effectiveness of the drive needs to be ensured through sensitization programs for the physicians to prevent the occurrence of the disease on one hand, and awareness among the public towards the prevention of the disease must be carried out. It is challenging for healthcare workers to fight against the outbreak in these remote districts. Prevention in such a scenario is much better as the right kind of antibiotic facility in such remote areas may not be a practical solution every time.

There is no vaccine as yet against scrub typhus. So, avoiding contact with infected chiggers is prudent to reduce the risk of getting infected. It is recommended to avoid all those areas where the occurrence of scrub typhus is frequent (where chiggers may be plenty) while traveling. Population outbursts and rising urbanization in the last few decades have altered the land-use pattern which seems to be a major contributing factor to the increasing scrub typhus cases across borders. Global warming trend and high humidity at the onset of monsoon could be the

<https://doi.org/10.1016/j.nmni.2023.101216>

Received 27 October 2023; Accepted 22 December 2023

Available online 23 December 2023

2052-2975/© 2023 The Authors. Published by Elsevier Ltd. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

other possible reason posing an infection threat, as chiggers love a hot and humid conditions. Altered human behaviors like trekking or camping in the deep greens for leisure increasingly exposures them to the vector in the wild, thereby increasing the infection risk [4]. There are no systematic vector control efforts in place yet. Using the Environmental Protection Agency (EPA)-registered insect repellents against chiggers is suggested. Clothing that cover arms and legs may be used. As permethrin kills chiggers, permethrin-treated items may be purchased, or the clothing and gear may be treated with 0.5 % permethrin [5]. Treated clothing remains protective even after multiple washings. It is important to note that, permethrin is intended to treat clothing only and must not be used directly on skin.

Declaration of competing interest

All the authors hereby declare that there are no conflicts of interest among them.

References

- [1] Mohapatra RK, Mishra S, Seidel V, Sarangi AK, Pintilie L, Kandi V. Re-emerging zoonotic disease Leptospirosis in Tanzania amid the ongoing COVID-19 pandemic: needs attention. *Int J Surg* 2022;108:106984.
- [2] Mohanty A, Kabi A, Gupta P, Jha MK, Rekha US, Raj AK. Scrub typhus - a case series from the state of Sikkim, India. *Int J Crit Illn Inj Sci* 2019 Oct-Dec;9(4):194-8.
- [3] Singh OB, Panda PK. Scrub typhus. <https://www.ncbi.nlm.nih.gov/books/NBK558901/>.
- [4] a Ranjan J, Prakash JAJ. Scrub typhus re-emergence in India: contributing factors and way forward. *Med Hypotheses* 2018 Jun;115:61-4. b Centers for Disease Control and Prevention. Scrub typhus. [https://www.cdc.gov/typhus/scrub/index.html#:~:text=Scrub/20typhus/2C/20also/20known/20as,body/20aches/2C/20and/20sometimes/20rash](https://www.cdc.gov/typhus/scrub/index.html#:~:text=Scrub/20typhus/2C/20also/20known/20as,body/20aches/2C/20and/20sometimes/20rash.). [Accessed 13 November 2020].
- [5] Mohapatra RK, Kandi V, Seidel V, Rabaan AA. Editorial: reemergence of neglected tropical diseases amid the COVID-19 pandemic: epidemiology, transmission, mitigation strategies, and recent advances in chemotherapy and vaccines. *Front Pharmacol* 2023;14:1265803. <https://doi.org/10.3389/fphar.2023.1265803>.

Ranjan K. Mohapatra**

Department of Chemistry, Government College of Engineering, Keonjhar,
758 002, Odisha, India

Snehasish Mishra
School of Biotechnology, Campus-11, KIIT Deemed-to-be-University,
Bhubaneswar, 751 024, Odisha, India

Lawrence Sena Tuglo
Department of Nutrition and Dietetics, School of Allied Health Sciences,
University of Health and Allied Sciences, Ho-00233, Ghana

Venkataramana Kandi
Department of Microbiology, Prathima Institute of Medical Sciences,
Karimnagar, 505417, Telangana, India

Aroop Mohanty
Department of Clinical Microbiology, All India Institute of Medical Sciences,
Gorakhpur, Uttar Pradesh, 273008, India
E-mail address: aroomohanty7785@yahoo.com.

Ranjit Sah*
Department of Microbiology, Tribhuvan University Teaching Hospital,
Institute of Medicine, Kathmandu, 44600, Nepal
Department of Microbiology, Dr. D. Y. Patil Medical College, Hospital and
Research Centre, Dr. D. Y. Patil Vidyapeeth, Pune, 411018, Maharashtra,
India
Department of Public Health Dentistry, Dr. D. Y. Patil Dental College and
Hospital, Dr. D. Y. Patil Vidyapeeth, Pune, Maharashtra, India

** Corresponding author. Department of Chemistry, Government
College of Engineering, Keonjhar, 758 002, Odisha, India.

* Corresponding author. Department of Microbiology, Tribhuvan
University Teaching Hospital, Institute of Medicine, Kathmandu,
44600, Nepal.

E-mail address: ranjank_mohapatra@yahoo.com (R.K. Mohapatra).
E-mail address: ranjitsah@iom.edu.np (R. Sah).

Handling Editor: Patricia Schlegelhauf