

# Recognizing The Significance of Scrub Typhus as An Emerging Threat

Gopinath R<sup>1</sup>, Arundadhi M<sup>2</sup>, G Sucila Thangam<sup>3\*</sup>

<sup>1,2,3</sup>Government Theni Medical College, Theni, Tamil Nadu, India

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**\*Correspondence:** Dr. G. Sucila Thangam (Email: drgsucilamicro@gmail.com)

Sir,

This is to draw attention to the pressing issue of scrub typhus, an often overlooked but rapidly emerging threat to public health. In recent years, the incidence of scrub typhus cases has been on the rise, necessitating a concerted effort from the medical community, policymakers, and the public to address and mitigate its impact. Scrub typhus, caused by the bacterium *Orientia tsutsugamushi*, is transmitted to humans through the bite of infected mites found in areas with dense vegetation.<sup>1</sup> While historically prevalent in the Asia-Pacific region, recent reports suggest a global expansion of scrub typhus, including cases in regions where it was previously considered uncommon.<sup>2</sup> Several factors contribute to the urgency of addressing scrub typhus as an emerging threat. Firstly, the non-specific symptoms of scrub typhus often lead to misdiagnosis or delayed diagnosis, allowing the infection to progress to severe stages. High fever, headache, and muscle pain are common early symptoms, and if left untreated, scrub typhus can lead to complications such as pneumonia, meningitis, and organ failure. Emphasizing the imperative for a deeper understanding of vectors, outbreaks, and pathogenesis related to potentially lethal organisms is crucial due to their association with outbreaks, both within endemic regions and beyond.<sup>3</sup> Scrub typhus, designated by the World Health Organization (WHO) as a severely under-diagnosed and under-reported infection, has the potential to lead to compli-

cations requiring hospitalization.<sup>4-5</sup> The transmission of Scrub typhus to humans is facilitated by infected larval mites known as chiggers, with common clinical manifestations including fever, headaches, body aches, and, in some cases, rashes.

The causative agent, *O. tsutsugamushi*, is an obligate intracellular bacterium, and its reservoir is maintained in trombiculid mites, which serve as both vectors and reservoirs.<sup>6</sup> The continuous maintenance of *O. tsutsugamushi* within mites is achieved through transstadial and transovarial transmissions. Transstadial transmission occurs as the pathogen is retained through larval, protonymph, and deutonymph stages, while transovarial transmission involves the female passing the pathogen to its eggs. Both transmission rates can be as high as 100%, ensuring the persistent presence of *O. tsutsugamushi* in mites. Mites are re-infected through contact with the bacterium from mammals and co-feeding on a naïve host harboring infected larvae.<sup>7</sup> Scrub typhus, historically marked by epidemics and sudden outbreaks, had significant impacts on troops during World War II in Myanmar, Sri Lanka, India, and West Bengal, with mortality rates reaching 40–45% in the pre-antibiotic era.<sup>8</sup> Following the war, a decline in reported cases occurred, possibly attributed to the application of tetracycline, chloramphenicol, and pesticides.<sup>9</sup> Despite temporary disappearances, scrub typhus resurfaced in epidemic forms in certain regions. The symptoms of scrub typhus fever, resembling

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other febrile illnesses, make diagnosis challenging. Pathognomonic eschars play a crucial role in clinical diagnosis, but their applicability is limited due to wide variation in distribution among patients. Presumptive and definitive tests, including reliable laboratory-based methods like direct (isolation, culturing, and PCR) and indirect (serological assays) approaches, are essential for accurate detection.<sup>10</sup>

In recent years, there has been a concerning resurgence of scrub typhus across various regions of India, marking its re-emergence as a significant contributor to acute undifferentiated febrile illnesses (AUI) characterized by notably high rates of morbidity and mortality.<sup>11-12</sup> This disease has manifested in a wide array of ecological contexts throughout India, with notable clusters of cases reported from regions spanning the length and breadth of the country. These include but are not limited to Tamil Nadu, Andhra Pradesh, Karnataka, and Kerala in the southern regions; Himachal Pradesh, Uttaranchal, Jammu, and Kashmir in the north; Meghalaya, Assam, and Nagaland in the northeastern parts; West Bengal and Bihar in the east; and Maharashtra and Rajasthan in the west.<sup>13</sup> In certain regions of the country, scrub typhus constitutes a significant proportion, ranging from 35% to 50%, of cases involving acute undifferentiated febrile illnesses necessitating hospitalization.<sup>14</sup> Among individuals hospitalized due to scrub typhus, approximately one-third of the patients experience multi-organ dysfunction, which may manifest as pulmonary, hepatic, cardiac, neurological, or renal complications, often resulting in elevated mortality rates.<sup>15-17</sup> In a recent study, 17.4% of cases had multiple organ dysfunction syndromes, 20.4% patients required ICU admission, and 19.1% needed ventilation. The overall case-fatality rate was 6.3%, and the mortality among those with multi-organ dysfunction syndrome was as high as 38.9%.<sup>14</sup> While scrub typhus poses a significant public health concern in India, its exact national burden and distribution remain uncertain due to limited data availability and the absence of adequate surveillance systems. Nonetheless, accurately assessing the burden of scrub typhus across India holds promise for enhancing control and management strategies to mitigate its impact effectively.

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