

**Case report:****How Much Challenging Scrub Typhus Could Be – A Case Report****Dr. Sourav Maiti¹, Dr. Shubham Dutta², Dr. Sobhan Gupta³, Dr. Susanta Nath Sarma⁴, Dr. Davis John⁵, Dr. Prolay Paul⁶**

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Abstract:

Scrub typhus, often known as bush typhus, is a condition brought on by “Orientia-tsutsugamushi” bacteria. Trombiculid mites transmit the rickettsial zoonotic disease known as scrub typhus to people region covered. Scrub typhus has been treated with a number of antibiotics, including rifampicin, macrolides, quinolones, tetracycline, and chloramphenicol. Since 1996, the reality of doxycycline resistance has been questioned, but resistance to tetracycline has been hypothesised to be the cause of delayed clinical improvement. In this zoonotic disease, humans serve as unintentional hosts. Although the Asia-Pacific region is the only place where scrub typhus can be found geographically, a billion people are at risk and there are around a million cases recorded annually. In conclusion, scrub typhus can be present in a variety of clinical ways. However, native patients from hilly areas, such as West Bengal, Himachal Pradesh, or Uttarakhand, frequently experience a milder course of illness without a rash or eschar. It is important to investigate whether this is a result of prior exposure to the organism, a different strain type, or other elements. Considerable edema on the face, the feet, and the upper eyelids are additional indicators of scrub typhus. Scrub typhus is a significant contributor to acute febrile illnesses that involve a variety of organ systems and are frequently vague.

Keywords: Scrub Typhus, Bacterial infection, Infectious disease, Bush typhus.

Introduction:

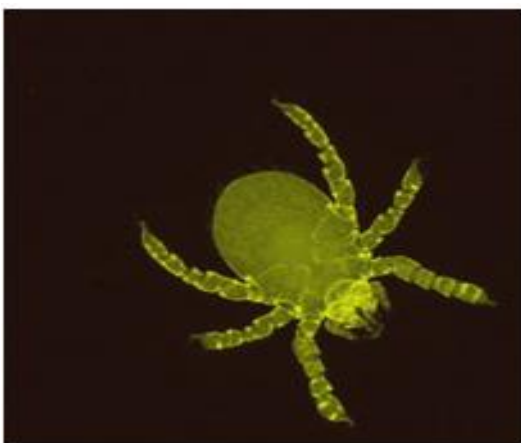
Scrub typhus is mostly found in Southeast and East Asia, the Pacific Islands, and a region known as the “Tsutsugamushi Triangle,” where it is one of the most under diagnosed and under-reported fever infections requiring hospitalization.¹ Scrub typhus, often known as bush typhus, is a condition brought on by “Orientia-tsutsugamushi” bacteria. Trombiculid mites transmit the rickettsial zoonotic disease known as scrub typhus to people region

covered.² According to expert assessment symptoms occurs Eschar, together with chills, headache, backache, myalgia, excessive sweating, vomiting, and swollen lymph nodes which may be present 2-3 days before a sudden onset of fever in people with scrub typhus.³ A macular or maculopapular skin rash may appear 3 to 8 days after the commencement of a fever. Scrub typhus has been treated with a number of antibiotics, including RIFAMPICIN, MACROLIDES,

QUINOLONES, TETRACYCLINE, and CHLORAMPHENICOL.⁴ Since 1996, the reality of doxycycline resistance has been questioned, but resistance to tetracycline has been hypothesised to be the cause of delayed clinical improvement.⁵ In this zoonotic disease, humans serve as unintentional hosts. Although the Asia-Pacific region is the only place where scrub typhus can be found geographically, a billion people are at risk and there are around a million cases recorded annually.⁶ Scrub typhus mortality rates range from 1% to 50% depending on the appropriate use of antibiotics, the health of the infected person, and the type of *O. tsutsugamushi* found.⁷ Scrub typhus became the most feared illness among Far Eastern soldiers during the Second World War. During the Second World War in India, scrub typhus epidemics spread to Assam and West Bengal.⁸ The illness spread gradually to various regions of India. In eastern and southern Asia, scrub typhus is endemic and has recently started to reappear.^{9,10} Sand beaches, mountain deserts, and tropical rain forests are among the places where this disease is also common.^{11,12} The ideal conditions for the infected mites to develop and can be found in specific places like grassy areas, riverbanks, and clearings in forests.^{13,14,15} These isolated places, often known as scrub typhus islands and are high-risk areas for human populations.¹⁶ Tropical regions experience year-round transmission of scrub typhus illness.¹⁷ Whereas, seasonal transmission occurs in temperate regions where rainfall affects the occurrence of *L. deliense*, with more chiggers attaching to the rodents in the wetter months of the year, which may explain why cases tend to concentrate during the rainy season.^{18,19} Scrub typhus is spread by *L. deliense* and *Leptotrombidium akamushi*, two parasites that are common in most South-East Asian nations and endemic in parts of India, Indonesia, the Maldives, Myanmar, Nepal, Sri Lanka, and Thailand.^{20,21} The vector mite is primarily found in a variety of biological niches, including subarctic terrains in the Himalayan regions, tropical rain forests, and semi-desert regions.²² A small region of strong transmission known as typhus islands may exist within these ecological areas, which are known as mite islands.²³ The

larval mites, sometimes known as "chiggers," are the means of infection transmission.²⁴ It is only the larval stage that consumes blood. The infection is conveyed to people and rodents by some infective trombiculid mite species (chiggers, *L. deliense*, and others), which feed on lymph and tissue fluid rather than blood. They contract an infection via eating the body fluid of small mammals, such rodents, and carry it with them for the whole of their lives.²⁵ As adults, they use a process called transovarial transmission to spread the disease to their eggs. Similar to this, the disease is transmitted from egg to larva or adult by a process known as transstadial transfer. Instead of biting or piercing the skin, mite larvae prefer to insert their mouth parts into the hair follicles or pores.²⁶ When people stumble over an infectious larval mite while standing, sitting, or laying on an infested surface, they become infected.²⁷ The life cycle of adult mites consists of four stages: egg, larva, nymph, and adult. The only stage (chigger) that can spread the illness to people and other vertebrates is the larva. Moreover, Chemo prophylaxis with doxycycline (200 mg once a week) can stop the disease for brief exposures, but it also allows for infection.²⁸ When begun prior to infection, doxycycline prophylaxis for scrub typhus has had encouraging outcomes.²⁹ There have been cases of vertical transmission from transplacental infection and transmission of perinatal blood-borne infections during delivery, specifically for scrub typhus in pregnancy, which results in neonatal scrub typhus in moms who have had an acute febrile sickness while pregnant.³⁰ Preterm birth, a rise in fetal loss, and small-for-gestational-age newborns are possible correlations. The chloramphenicol should be used cautiously to stop fetal transmission during the third trimester of pregnancy.³¹ Doxycycline, a category D medication, should not be used by pregnant women. In children, scrub typhus can range from moderate to severe.³² The majority of patients arrive with fever and localized or widespread lymphadenopathy. Hepatomegaly, splenomegaly, a single painless eschar, a maculopapular rash, and gastrointestinal symptoms (abdominal discomfort, vomiting, and diarrhea) may also be present.³³ Although child

deaths are rare, the case fatality rate in untreated children may be as high as 30%. In India during the 1960s and 1970s, scrub typhus was an endemic illness in several areas of India.³⁴ However, as insecticides became more widely used in later years, it appeared to have all but vanished from our nation. Scrub typhus is mainly common in West Bengal's hilly forested region.³⁵ The Kurseong subdivision is covered in dense greenery, mostly tea plantations. The grassy fields, shrubby areas, woodlands, tea plantations, and cleared forests give a favourable habitat for the mite to survive. In 2010, 2011, and 2012, the Integrated Disease Control Programme's West Bengal State Surveillance unit in Kurseong, Mirik (West Bengal's Darjeeling district) consistently reported outbreaks of scrub typhus.³⁶ However, no fatalities were recorded, and doxycycline was used to treat every case, with satisfactory results. The prior outbreaks have been linked to the vector *Leptotrombidium deliense*'s prevalence.³⁷ It has been noted that *L. deliense* has been absent from recent outbreaks, and an intriguing discovery has been made, namely the emergence of *Schoengastiaella ligula* as the principal vector in the outbreak in the Kurseong district and researchers are investigating under proper survey.³⁸ On the other hand, further research is necessary to determine whether or not antibiotic-resistant scrub typhus exists.³⁹



Case History:

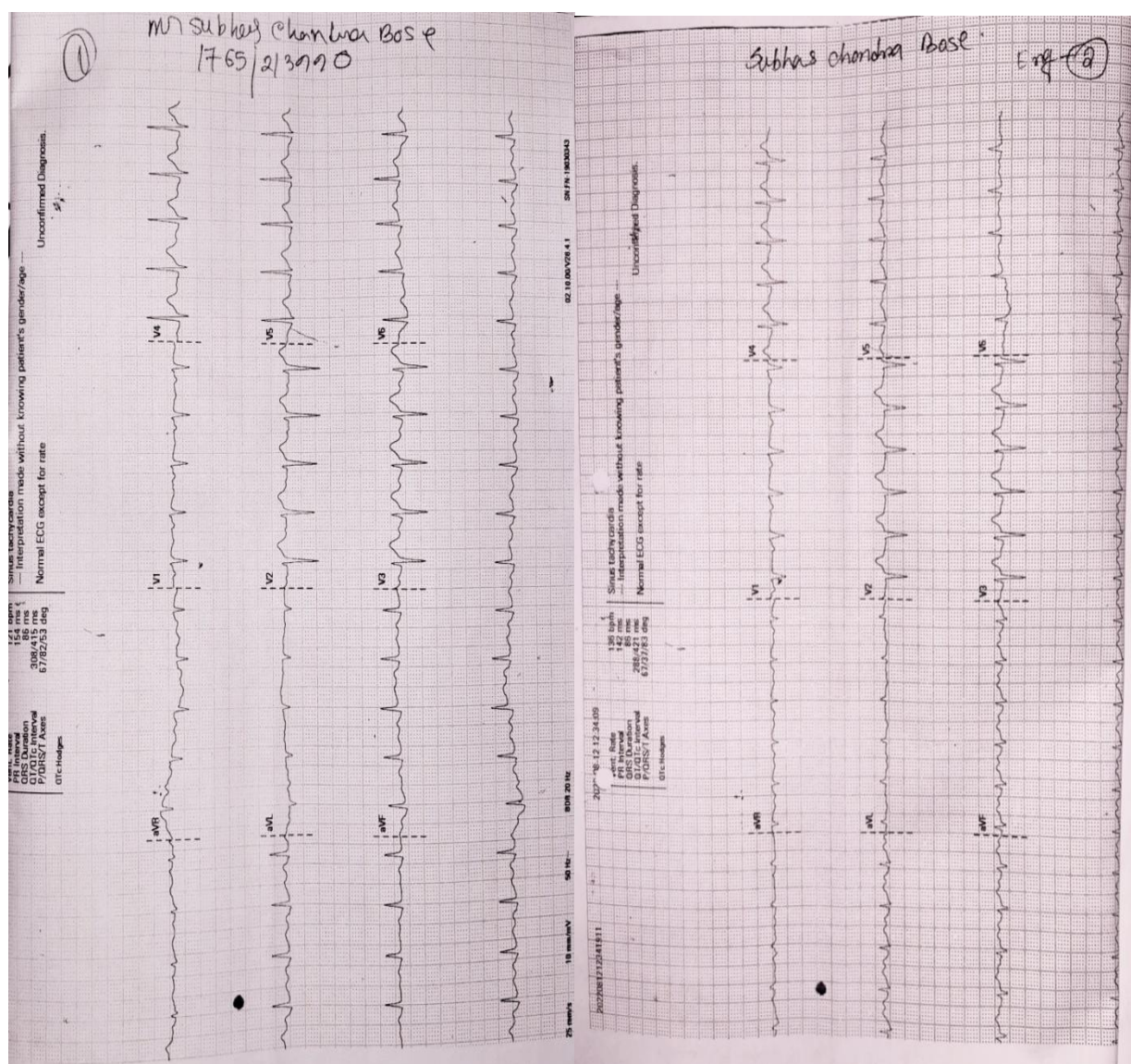
A 58 year old male patient who was freshly diagnosed with “SCRUB TYPHUS” with associated symptoms fever with chills that did not touch the baseline, even ongoing loose stools, cough, rashes, abdominal pain and also with acute kidney pain. At first, patient was seen with fever,

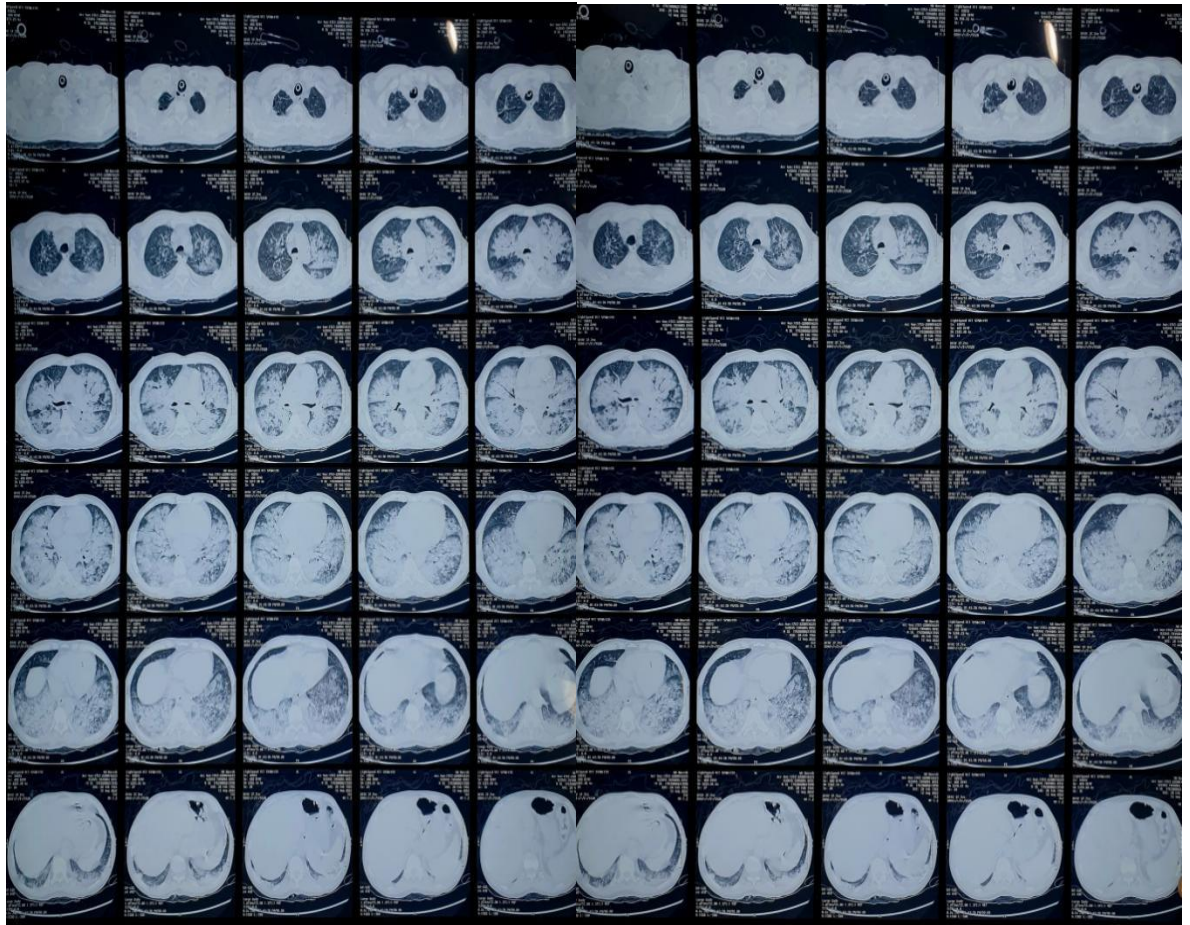
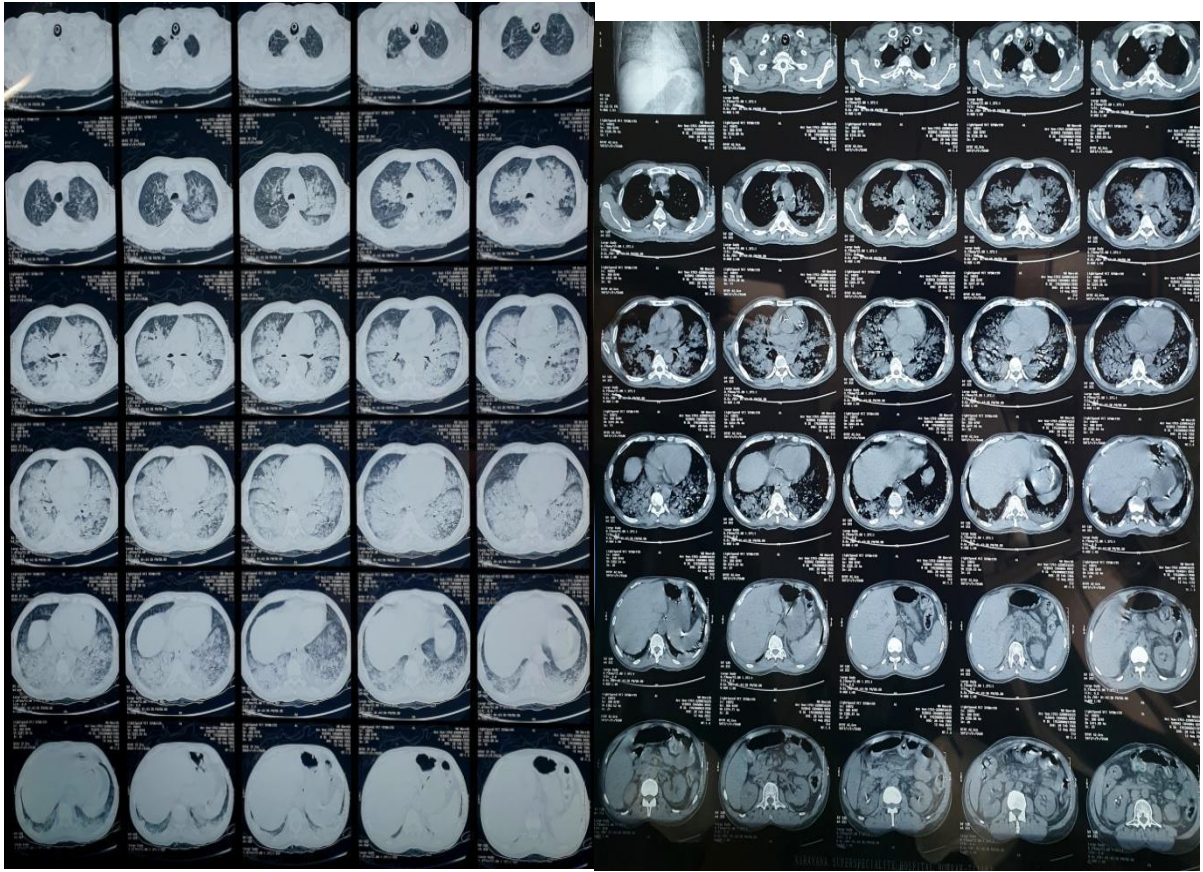
headaches and body pain but after 5 days of consistent illness he was flushed with life-threatening symptomatic. Moreover, he was admitted into causality ward and later transferred into MICU ward under strict monitoring and was on antibiotics. The patient had a leukocyte count of 11000/ μ l with a striking neutrophilia (around 90%) and low platelet count (85000/ μ l). Haemoglobin level was 10.3g/dl. CRP level was high (302.93 mg/l) along with serum urea (145 mg/dl) and creatinine (3.3 mg/dl). Serum was positive for scrub typhus IgM antibodies by immunochromatography with negative results for typhoid, malaria, dengue etc. Repeated blood and urine cultures grew no microorganism. Liver enzymes were raised (AST 117 U/L; ALT 61 U/L) with a low serum albumin (2.4 g/dl) and a marginally elevated gamma-glutamyl transferase level. His chest X-Ray and CT-Scan were done to observe detailed information and explained spo2 was 92-95%. A supportive care was given continuously throughout the medical regimen. Computed Tomography (CT-Scan) has illustrated exile information about the associated diseases (Pleural effusion with phlegm). An electrocardiogram (ECG) was done to diagnose and monitor conditions affecting the heart. Starting from the first day his heart rate was tumbling but after immediate supportive care the patient was stabling into good nurture by avoiding deteriorating condition. The maxillary, ethmoidal, and sphenoidal sinuses, as well as the bilateral mastoid air cells, all displayed mucosal thickening on neck vessel imaging. However, after continuous intervention chest cripts were normal, bp was under controlled, but ABG (arterial blood gas) shows type -1 respiratory failure. On the 3rd day When SPO2 was 80 and started declining then O2 support was provided at 5AM and became normal 85-90; after strict monitoring 8-10 liter O2 support was provided when sudden saturation has fallen down. Hence, ABG shows hypoxia BIPAP (bilevel positive airway pressure) trial done but failed. Patient was getting drowsiness and aspirated with gasping. Patient was intubated into ventilation and central-line was done by which prognosis was done. Frequent X-Rays shows 70-80% consolidation with ground glass opacity. CT

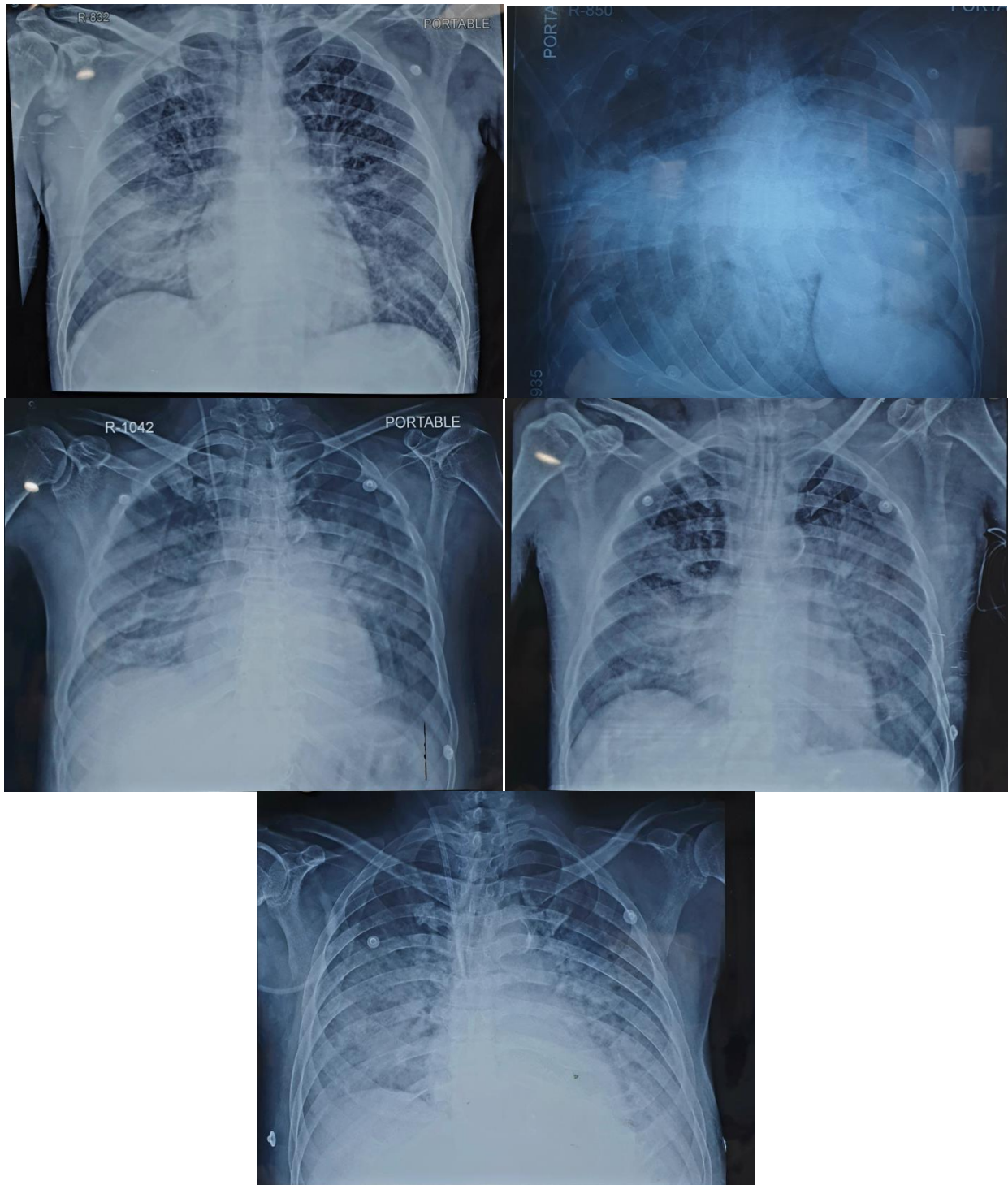
thorax was done after stabilization. Patient was diagnosed with “Lower respiratory tract infection (LRTI), Scrub Typhus associated with Acute Pneumoniae and Acute Kidney Infection (AKI)” and therapeutically treatment started with antibiotics and further followed with excavated from PIPTAZ to MEROPENAM with DOXYCYCLINE and also with other supportive care and measurement. Test of CRP (C-reactive protein) was done on and Patient was on ventilation with injection SOLUMEDROL infusion followed by injection FENTANYL infusion to keep off the pain. On intervention, sedative and paralysis and patient is not maintaining saturation after FIO2 (fraction of inspired oxygen) to 100% which has driven into 88%. Again patient was prescribed by injection MEROPENAM 1 gram IV for three times in a day, injection DOXYCYCLINE 100 mg IV for

twice a day, injection SOLUMEDROL 40 mg IV for thrice a day, NEBU-BUDECORT and NEBULIN was given for twice and thrice a day for saturation support. This medication was continued for 10 days and on 12th day syrup POTKLOR 1.5 gm and syrup DUPHALAC 10 ml was prescribed. Followed by, tab SOBOSIS 500 mg for twice a day and also capsule NEFROSAVE 500 mg for twice a day. Patient was alternatively prescribed with infusion PARACETAMOL 1mg with frequency thrice a day. As patient was a pre-diabetic patient so he was handled with fragile. Hence, diabetic medications were given regularly medications such as Injection HUMAN ACTRAPID 40 IU before meal once a day, Injection LANTUS 10 units once in a day after meal even Injection MULTIVITAMINS and PANTOPRAZOLE 40 mg was given once in a day.

Detailed examination of CT-SCAN and ECG:







Discussions And Conclusion:

Due to a vast diversity in the antigenic protein, which is the most abundant protein in the *Orientia* genus, *Orientia tsutsugamushi*, the causal agent, has more than 20 antigenically different serotypes.⁴⁰ The considerable variation in scrub typhus illness severity and disease presentation is largely attributed to this serotypal diversity. Due to the increased amount of time spent outdoors, young adults (20 to 40 years old) were the group most affected.^{41,42} It was observed that women

outnumbered men, which was consistent with prior risk factor assessment research. This is due to the fact that in hilly locations, it is typically the women that contribute to household farming tasks as well as find and transport fuel from the trees. In line with prior studies, the peak caseload was observed in the monsoon months of July, August, and September.^{43,44} This is a result of the plentiful vegetation growth, higher occupational exposure brought on by the concurrent harvesting season, and more people spending more time in the fields during the wet season. Therefore, especially in

these regions, preventive measures like personal protective equipment can significantly reduce the transmission. Only seven of one patient had eschar, which is referred to as the distinctive lesion. Eschar is more prevalent in cases from other Asian nations.⁴⁵ This might be as a result of regional variation in the infecting serotype, the high skin pigmentation of the Indian subcontinent, and high rates of under-detection brought on by the eschar's painless and non-itchy characteristics. Edema, particularly the upper eyelids, the face, and the feet, was another commonly encountered and reported condition. When compared to the frequency of face and pedal edema reported in north-east Himalayan investigations, this is significantly higher.⁴⁶ When Orientia multiply in the endothelial cells of small blood vessels, the vascular barrier is breached (perivasculitis), causing fluid to accumulate in the interstitial Spaces And Edema To Develop. Optic Nerve And Retinal Edema, But Not Upper Eyelid Edema, Were Described In The Investigation Of The Patient Demonstrating Ocular Abnormalities In Scrub Typhus.⁴⁷ When Evaluating A Patient With An Acute, Non-Differentiated Febrile Illness From A Rural Background In A Tropical Nation Like India, Scrub Typhus Should Be Considered Among The Differentials. In Conclusion, Scrub Typhus Can Be Present In A Variety Of Clinical Ways. However, Native Patients From Hilly Areas, Such As West Bengal, Himachal Pradesh, Or Uttarakhand, Frequently Experience A Milder Course Of Illness Without A Rash Or Eschar.⁴⁸ It Is Important To Investigate Whether This Is A Result Of Prior Exposure To The Organism, A Different Strain Type, Or Other Elements. Considerable Edema On The Face, The Feet, And The Upper Eyelids Are Additional Indicators Of Scrub Typhus.⁴⁹ In The Absence Of Gold-Standard Confirmatory Tests In Resource-Poor Settings, Primary Care Physicians Can Play A Critical Role In Preventing This Potentially Fatal Clinical Entity From Spiraling Into A Significant Public Health Issue By Early Recognition And Treatment Based On Clinical Presentation And Simple Laboratory Parameters. Scrub Typhus Is A Significant Contributor To Acute Febrile Illnesses

That Involve A Variety Of Organ Systems And Are Frequently Vague.⁵⁰

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