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PURPURA FULMINANS SECONDARY TO RICKETTSIAL INFECTION: A RARE CASE REPORT

Dermatology

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ABSTRACT

Purpura fulminans is a rare, life-threatening dermatological emergency characterized by rapidly progressive hemorrhagic necrosis of the skin, commonly associated with severe infections and disseminated intravascular coagulation. Rickettsial infection is uncommon cause of purpura fulminans, especially in tropical regions leading to misdiagnosis. A 34-year-old male presented with high-grade fever with chills for six days, breathlessness and polyarthralgia for four days, and a rapidly progressive purpuric rash for one day. Cutaneous examination revealed multiple tender retiform purpura with hemorrhagic bullae over the trunk and bilateral upper and lower limbs. Laboratory evaluation revealed thrombocytopenia and coagulopathy, with serologically confirmed rickettsial infection. Prompt initiation of doxycycline along with supportive care led to gradual clinical improvement. Our case report highlights needs to maintain high index of suspicion for rickettsial etiology in patient presenting with purpura fulminans in endemic areas.

KEYWORDS

Rickettsial Infections; Retiform Purpura; Endemic Typhus; Purpura Fulminans; Doxycycline

INTRODUCTION

Purpura fulminans is a rare, rapidly progressive, and potentially fatal thrombotic disorder characterized by extensive cutaneous hemorrhage, necrosis, and disseminated intravascular coagulation. It is classically associated with severe bacterial sepsis—most commonly meningococcemia—along with congenital or acquired deficiencies of natural anticoagulant pathways, particularly protein C and protein S. The hallmark pathology involves acute microvascular thrombosis resulting from profound endothelial injury and dysregulated coagulation, leading to skin necrosis and systemic complications. Rickettsiae are obligate intracellular Gram-negative bacteria. These infections predominantly target vascular endothelial cells, producing widespread vasculitis, increased vascular permeability, thrombocytopenia, and multiorgan involvement. Cutaneous manifestations are common and varied; however, progression to purpura fulminans is exceedingly rare with very few documented cases. Recognition of purpura fulminans as a possible manifestation of rickettsial infection is therefore critical, as early treatment with doxycycline can be life-saving. This report highlights a rare presentation of purpura fulminans secondary to rickettsial infection, underscoring the importance of clinical suspicion and timely intervention in tropical febrile illnesses.

Case Report

A 34-year-old male patient presented with high-grade fever with chills for six days, breathlessness and polyarthralgia for four days, and a rapidly evolving purpuric rash for one day. He gives history of recent travel to Rajasthan prior to onset of symptoms. Cutaneous examination revealed multiple tender retiform purpura all over body excluding face, palm, sole with bullae distributed over the bilateral upper limb, lower limbs and trunk (Figure 1). Routine laboratory investigations showed haemoglobin of 12.7 g/dL, leucocytosis (25,000/mm^3), and severe thrombocytopenia (48,000/mm^3), abnormal prothrombin time, increased D-dimer value (6040). Fever workup was negative for dengue, malaria, and typhoid. Weil–Felix test demonstrated significantly elevated OX19 and OX2 titres (1:320), histopathology of retiform purpura showed perivascular inflammatory infiltrate with microthrombi in dermal vessels with extravasated erythrocytes supporting a diagnosis of rickettsial infection. Based on clinical and laboratory findings, a diagnosis of purpura fulminans secondary to rickettsial infection was established.

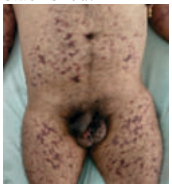

Figure-1

The patient was treated promptly with intravenous doxycycline (100 mg twice daily). After 5 days of initiation doxycycline, patient improved .Cutaneous manifestations improved with regressing in the retiform rash and patient was discharged after 15 days of hospital stay.(figure 2)

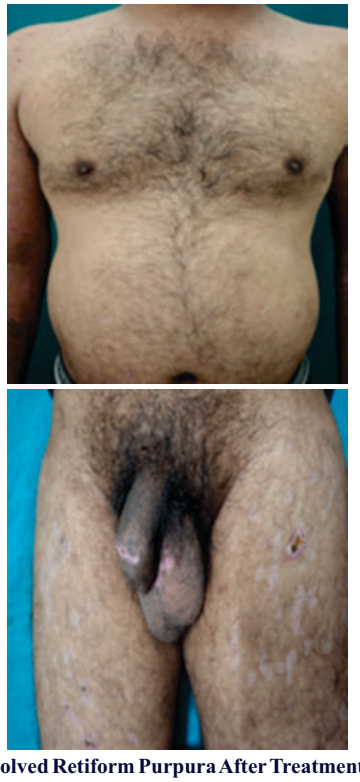

Figure 2: Resolved Retiform Purpura After Treatment

DISCUSSION

Rickettsial diseases are vector-borne infections that commonly affect individuals traveling to or residing in endemic regions. In India, rickettsial infections have been increasingly reported from states such as Maharashtra, Tamil Nadu, Karnataka, Kerala, Jammu and Kashmir, Uttarakhand, Himachal Pradesh, Rajasthan, Assam, and West Bengal (Rathi & Rathi, 2010). These infections are caused by a heterogeneous group of Gram-negative, obligate intracellular bacteria belonging to

the genus Rickettsia. Classically, rickettsiae are categorized into the typhus group and the spotted fever group (SFG). Humans are incidental hosts in the zoonotic transmission cycle involving rodents and arthropod vectors such as ticks, mites (chiggers), and fleas (Rahi et al., 2015). Clinically, rickettsial infections typically present with an abrupt onset of moderate- to high-grade fever, malaise, headache, deep muscle pain, and conjunctival congestion (Holman et al., 2009). Cutaneous manifestations are common and usually begin as a maculopapular rash around the third day of fever, initially involving the extremities and progressing centripetally to involve the trunk and rest of the body (Jayaseelan et al., 1991). Severe and untreated infections may progress to life-threatening complications such as acute respiratory distress syndrome, disseminated intravascular coagulation (DIC), purpura fulminans, and multiorgan failure (Honarmand, 2012). Purpura fulminans is a rare but fatal thrombotic disorder characterized by widespread intravascular thrombosis and hemorrhagic infarction of the skin, rapidly progressing to DIC(full form) and vascular collapse (Chalmers et al., 2011). Clinically, lesions initially present as well-demarcated erythematous macules that quickly evolve into irregular areas of blue-black hemorrhagic necrosis (Edlich et al., 2009). Based on etiology, purpura fulminans is classified into three types: neonatal purpura fulminans due to inherited deficiencies of protein C or protein S (Findley et al., 2018), idiopathic or acquired purpura fulminans often following viral infections (Choo et al., 1995), and acute infectious purpura fulminans, which is the most common form and occurs in the setting of severe bacterial sepsis (Fukuta et al., 2021). The presence of purpura fulminans is a poor prognostic indicator and is frequently associated with severe systemic involvement and increased mortality. Rickettsial infection is rare cause of purpura fulminans can be diagnosed clinically and serologically. The Weil–Felix test remains the oldest serological assay for the diagnosis of rickettsial infections, based on cross-reacting antibodies against Proteus antigens. Although it lacks sensitivity and specificity, it continues to be used as an initial diagnostic tool in resource-limited settings. IgM antibodies typically become detectable 5–10 days after symptom onset. Agglutination with Proteus vulgaris OX-2 is suggestive of SFG rickettsial infections (except Rocky Mountain spotted fever), while OX-19 reacts with sera from typhus group rickettsiae and RMSF. OX-K agglutination is characteristic of scrub typhus. A fourfold rise in titers or a single titer ≥1:320 is considered diagnostic (Rahi et al., 2015). Rickettsial infections may occasionally follow a fulminant and life-threatening course. Doxycycline remains the drug of choice for SFG rickettsioses, with alternatives including chloramphenicol, macrolides, and rifampicin. Antibiotic susceptibility does not vary significantly among different rickettsial species; therefore, precise species identification is not mandatory for initiating treatment (Rahi et al., 2015).

CONCLUSION

This case highlights rickettsial infection as a rare but important cause of purpura fulminans in endemic regions. Rickettsial etiology should be strongly considered in patients presenting with acute febrile illness, rapidly progressive purpura, and laboratory evidence of coagulopathy, especially when common tropical infections are excluded. Heightened clinical suspicion and early empirical treatment with doxycycline can be life-saving and may prevent irreversible complications and mortality.

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