

# Rickettsial diseases: A group of underdiagnosed fevers

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## ABSTRACT

**Background:** Rickettsias are zoonoses transmitted to humans by arthropods. Their clinical manifestations vary. Prompt and effective treatment is recommended before biological confirmation. The aim of this study was to establish the epidemiological and clinical profiles of this group as well as its different extracutaneous manifestations. **Materials and Methods:** This retrospective study included patients with rickettsiosis who consulted between June 2016 and October 2022. **Results:** Twenty-nine patients, with a male predominance of 66%, aged between 2 and 74 years. A maculopapular rash was present in all cases. Symptomologies ranged from neurological and digestive to renal. All our patients underwent a rickettsia check-up and serology. Twenty-five patients presented a febrile cutaneous eruption forty-eight hours after the tick, leading to hospitalization and prompt treatment. Evolution was characterized by disinfiltration and positive improvement. **Conclusion:** Because rickettsial diseases have a wide geographical distribution, recognition of their symptoms is essential for prompt treatment.

**Key words:** Rickettsias; Eruption; Escharotic

## INTRODUCTION

Tick-borne rickettsia is caused by Gram-negative bacteria belonging to the spotted fever group of the genus *Rickettsia* [1]. Among the oldest vector-borne diseases, these zoonotic diseases are the most common. The first clinical description of Rocky Mountain spotted fever (RMSF) in Idaho, U.S., was reported by Edward E. Maxey in 1899, and the first case of Mediterranean spotted fever (MSF) was reported by Conor and Brush in Tunisia in 1910 [2]. The disease affects people of all ages and mainly occurs in summer. The clinical presentation varies from mild to highly severe, with a mortality of 2–6% [3]. The signs are fever, headache, maculopapular rash, an escharotic spot, and localized adenopathy. Rickettsial diseases are also difficult to diagnose, as there are no rapid point-of-care tests to establish the diagnosis during acute infection, and the confirmation of the diagnosis, when sought, is usually retrospective using serological methods [3]. Treatment should be administered prior to biological confirmation for early and rapid improvement [4]. The objective

of our study was to identify the epidemiological and clinical characteristics of our patients followed for rickettsial disease.

## MATERIALS AND METHODS

In this prospective, retrospective, cross-sectional study, we collected all cases of rickettsiosis consulted at Hassan II Hospital of Dermatology and the emergency room between June 2016 and October 2022.

## RESULTS

We collated 29 patients, with a male predominance of 66%, aged between 2 and 74 years. The legs and thighs were the most frequent topography of the escharotic spot (Fig. 1a); maculopapular rash was present in all our cases (Figs. 1b and 1c); purpura was present in 67%. The extracutaneous symptoms were rich and varied between neurological in 7 patients (headache, dizziness, behavioral, and consciousness disorders), digestive in

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**Figure 1:** (a) Erythematous placard on the lower extremity. (b and c) Erythematous plaques centered by the escharotic spot.

5 (abdominal pain, nausea, and vomiting), and renal in 10. The average time to onset of the symptoms was 4 days. Six patients were admitted to the emergency room for a disorder of consciousness diagnosed late as secondary to rickettsiosis. Biological tests showed hyperleukocytosis with a neutrophil predominance and elevated CRP in all our patients. Serology for rickettsial disease was positive in twelve patients. Our patients described a typical cutaneous reaction composed of a febrile cutaneous and mucosal rash forty-eight hours after the tick bite (Fig. 2), particularly in one patient, who presented a declining infiltrated purpura on the limbs, diagnosed as vasculitis after a cutaneous biopsy. Doxycycline 200 mg/day was prescribed as a formal indication. A lumbar puncture and cerebral MRI of four patients revealed secondary cerebral MRI of rickettsial disease. There was also vasculitis and encephalitis. In the case of abdominal pain and lipasemia five times normal, an abdominal scan was performed, which showed pancreatitis at stage E, from where the indication of the addition of ciprofloxacin for seven days was given to the six patients. The evolution was marked by the disinfiltration of the rash and the healing of the escharotic ulceration, as well as the improvement of other cerebral and digestive conditions. However, one patient ultimately died. This was due to his late consultation and the late initiation of therapy.

## DISCUSSION

Rickettsia, also known as spotted fever, is caused by *Rickettsia conorii* and is transmitted by the brown dog tick [5]. Cases occur during the summer months when ticks are most active [6].



**Figure 2:** A tick responsible for the bite.

The time from the moment of infection and the incubation period to the onset of the disease is six days on average. Often, patients present with a sudden increase in body temperature, flu-like syndrome (headache, chills, joint, and muscle pain), and scabs (“black spots”) at the site of the tick bite [7]. These scabs are characteristic of the disease. These are red, inflamed papules, necrotic in the center, black, painless, more often located on the trunk, legs, or arms (in infants, they are more often found on the scalp in the occipital region). Sometimes, scabs may be absent. A generalized maculopapular rash (97%) affects the extremities and trunk. Other common clinical symptoms include myalgia, headache, conjunctivitis, hepatomegaly, and splenomegaly. Gastrointestinal symptoms may occur in approx. 30% of patients and are more common in children [8]. The severe form occurs in 5–6% of cases and is associated with disseminated vasculitis, renal, neurological,

and cardiovascular complications, and phlebitis. In a recent prospective study in Algeria, 49% of patients were hospitalized with severe forms. The overall mortality rates for patients hospitalized with severe neurologic signs and multiple lesions were 3.6% and 54.5% [9]. In order to include it in the differential diagnosis of undifferentiated fever, the clinical symptoms and epidemiological knowledge of rickettsia are required. Serology is the basis for diagnosis and indirect immunofluorescence (ELISA) is the serological method of choice [10]. If rickettsiosis is suspected, empirical treatment should be initiated prior to *in vitro* laboratory susceptibility and *in vivo* confirmation. Doxycycline is currently recommended for the treatment of rickettsiosis. For adults, doxycycline 200 mg for 2-to-5 days or within twenty-four hours of fever is most commonly used, yet doxycycline 200 mg once administered has been shown to be effective in some cases of rickets in the spotted fever group [11]. The treatment of severe forms of the disease involves an intravenous administration of 200 mg doxycycline per day, followed by oral administration of 200 mg doxycycline per day until complete recovery (10 days). For children and pregnant women, treatment with certain macrolides for 5 to 7 days is recommended. However, a single dose of doxycycline at 5 mg/kg/day is effective and does not cause the side effect of tooth discoloration. In individuals allergic to tetracycline, ciprofloxacin (1.5 g/day, orally administered for 5 days) or chloramphenicol (2 g/day, 7 to 10 days) is effective against rickettsia erythematosis [12]. Its prevention relies on early detection (within twenty hours) and the appropriate removal of ticks in order to avoid transmission. There are no vaccines available for the prevention of rickettsial diseases or antibiotic prophylaxis. We have outlined several points concerning this bacterial infection in our cases and the literature: it is a severe infection that is potentially fatal, and dermatologists should be aware of it so that they may initiate TRT without delay.

## CONCLUSION

Rickettsial diseases are present worldwide and continue to emerge and re-emerge as leading causes of febrile illness. Early identification of clinical presentations will be helpful in prompt and appropriate treatment.

## Statement of Human and Animal Rights

All the procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the 2008 revision of the Declaration of Helsinki of 1975.

## Statement of Informed Consent

Informed consent for participation in this study was obtained from all patients.

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