Case Report

iMedPub Journals
www.imedpub.com

Health Science Journal
ISSN 1791-809X

2021
Vol. 15 No. 7: 857

A Septic Shock and Multi-Organ-Failure Case due to Mediterranean Spotted Fever

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Citation: Larnè D, Polimeni M, Basile R, Carpentieri M, De Lorenzo S, et al. (2021) A Septic Shock and Multi-Organ-Failure Case due to Mediterranean Spotted Fever. Health Sci J. 15 No. 7: 857.

Abstract

Rickettsia Conorii is an obligate intracellular gram-negative bacterium that causes a spectrum of different syndromes. An 83-year-old splenectomised patient has septic shock associated with coagulopathy and multi-organ-failure. The patient is treated with doxycycline, vasoactive amines, fresh frozen plasma, antithrombin III with progressive clinical improvement. Mediterranean spotted fever is a pathology that frequently has benign characteristics however, in fragile patients it can manifest itself with severe clinical conditions.

Keywords: Mediterrenean spotted fever; Zoonosis; Rickettsia conorii; Septic shock; Multi-organ failure

Received with Revision July 09, 2021, **Accepted:** July 23, 2021, **Published:** July 29, 2021

Introduction

Mediterranean spotted fever (MSF) is a zoonotic disease caused by Rickettsia conorii, an obligate intracellular gram-negative bacteria [1].

R. conorii is trasmitted via the bite of Rhipicephalus sanguineous, endemic in the Mediterranean area and MSF is the most common rickettsiosis in Europe [2].

The clinical manifestation of MSF is typically characterized by a black eschar at the tick bite site (*tache noir*), fever, a skin rash within 6 to 10 days, headache, muscle aches and asthenia [3].

Although the disease in most cases is self-limiting, sometimes it can lead to severe complications, septic shock and multi-organ failure are rare complications [4].

We report the case of an 83-year-old patient who suffered from septic shock and multi-organ-failure due to Mediterranean spotted fever.

Case Report

In September 2020, after about 5 days of fever (T max 38°C) associated with headache, myalgia, mild dysuria and nuanced papular-macular exanthem, particularly spread on the trunk and also on palmar-plantar areas, an 83-year-old man was admitted to the Emergency Room of the Grand Metropolitan Hospital of Reggio Calabria, Italy.

He comes from a rural area of Reggio Calabria's province. After consultation with the infectious disease specialist the patient was admitted to the Infectious Diseases ward.

The patient has a history of hypertension, benign prostatic hypertrophy, splenectomy for more than 20 years due to a previous hamartoma and a slight deficiency in coagulation factor VII.

On physical examination the patient was alert, responsive, oriented in time and space, arterial blood pressure 135/80 mmHg, heart rate 82 pulse/min, SO_2 in ambient air 97%, respiratory rate 20 acts/min, feverish (T 38.6°C).

While blood chemistry tests showed neutrophilic leukocytosis (white blood cells 18.090 mm^3 with 95% neutrophils), thrombocytopenia (platelet count 79.000 mm^3), creatinine 1.3 mg/dl; values in the normal range of PT, PTT, fibrinogen, antithrombin III, transaminases and bilirubin; increase in inflammation index with C-Reactive Protein 250 mg/L (normal value <5 mg/L) and procalcitonin 14.4 ng/ml (normal value <0.5 ng/ml).

After admission, blood cultures, urine cultures, Weil-Felix reaction, serology for R. conorii, HIV and syphilis tests were performed.

Suspecting urinary tract infection and Mediterranean spotted fever, an empiric antibiotic treatment with piperacillin tazobactam 4/0.5 g iv q6h and doxycycline 100 mg po q12h was administered.

After 48 hours, the patient's conditions worsened, developing a septic shock for which, on the advice of the anaesthesiologists, infusion therapy with vasoactive amines is administered.

In this period he develops a blood chemistry of multi organ failure, with increase of creatinine 2.9 mg/dl, bilirubin 2.57 mg/dl, ALT 109 U/L, and dyspnoea with need for oxygen therapy; given persistence of the fever and the worsening of the c- reactive protein and procalcitonin, respectively at 280 mg/L and 25 ng/dl, further blood cultures tests are performed and the antimicrobial therapy was modified to exclude piperacillin tazobactam in favour of meropenem and daptomycin; therapy with doxyciline continues.

Haemodynamics improve after 72 hours from the start of the vasoactive amines and these are stopped; on the seventh day the patient develops diffuse purpura in the trunk, limbs, palmoplantar areas as well as modest subconjunctival haemorrhages; the hematochemical data documented a coagulopathy characterized by thrombocytopenia (PLT 21.000mmc), marked deficiency of antithrombin III (32%, normal value 70-130), low fibrinogen value 74 mg/dL (normal value 200-400 mg/dL), PT 26 (9-12.5), PTT 41.2 sec (25-37).

On this basis and on the advice of haematologists, platelet transfusions, infusions of fresh frozen plasma and antithrombin III were performed. Microbiological examinations performed on the admission blood cultures, urine culture, Weil Felix reaction and serology for R. conorii, syphilis and HIV, as well as repeated blood cultures three days after admission following the shock phase were all negative. The coagulopathy picture is resolved without difficulties and antimicrobial therapy is stopped on day 10. Weil Felix reaction and R. conori serology were repeated on day 7 with negative results; they were repeated on day 14 from admission with result of Weil Felix and serology positive IgM 1/64. On day 19, serology was positive for IgM 1/128 and IgG 1/64. After 30 days of hospitalization, the patient was discharged in good clinical condition with the advice to continue the follow up for the coagulation factor VII deficiency.

Discussion and Conclusion

Mediterranean spotted fever is a zoonotic disease caused by R. conorii [1]; frequently is a self-limiting disease; it is in fact estimated that 4-8% of the population carry antibodies against Rickettsia without a previous clinical history of MSF [2], however it is estimated that about 5-10% of MSF cases could be severe [2].

The most common symptoms are black eschar on the side of the bite, fever, maculopapular rash, myalgia and asthenia [3] but there are also documented cases of myocarditis and myocardium-pericarditis [5,6], acute kidney failure [7], sigmoid perforation [8], isolated acute hepatitis [9], ARDS [10], septic shock [11], multiorgan failure (MOF) [4] and disseminated intravascular coagulation (DIC) [12].

Besides, in a series of 278 cases with heterogeneous clinical manifestations the following complications were observed: kidney failure (3.2%), bronchopneumonia (1.4%), hepatitis (1.1%), encephalitis (0.7%), myocarditis (0.7%) [13].

In most cases the diagnosis is clinical; laboratory confirmation is based on the Weil-Felix agglutination test and/or on the detection of IgG-IgM antibodies by enzyme-linked immunosorbent assay (ELISA) and micro-immunofluorescent assay (IFA) [2].

Complete blood count abnormalities are non-specific; frequently leukocytosis, leukopenia or normal white blood cell count may be present, thrombocytopenia is frequent, inflammatory markers and liver function tests are usually raised [14].

Our case is of particular interest given the coagulopathy condition that the patient developed probably caused by the coagulation factor VII deficiency that the patient presented.

Our patient was splenectomised and this, could have contributed to a severe disease manifestation.

Causes of severe disease manifestation relate to older age, comorbidities as diabetes mellitus, immunodepression, cardiac pathology, chronic alcoholism and G6PDH deficiency [15].

According to the guidelines of the Italian Society of Tropical Diseases, treatment of MSF is doxicicline 100 mg os q12h for 10 days [16].

In conclusion, Mediterranean Spotted Fever is a disease that can have different clinical pictures: from benign pictures to really serious manifestations. For a correct management of the patient an accurate medical history and a scrupulous objective examination are mandatory because the microbiological data are often late. Although is not common, R. conorii can also cause coagulopathy, septic shock and multiorgan failure.

Conflict of Interest: None to declare

Funding: None

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