

Erysipelothrix rhusiopathiae septicaemia in systemic lupus erythematosus

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SUMMARY

Erysipelothrix rhusiopathiae is a Gram-positive bacillus that is rarely reported as a causative agent of infections in humans. Human cases in most instances present as localized or generalized skin infections. Invasive infections are exceptionally described and septic forms are usually associated with endocarditis. We report a case of invasive infection caused by *Erysipelothrix rhusiopathiae* without skin or endocardium

involvement in a patient with systemic lupus erythematosus (SLE). To our knowledge, this is the first report of an isolated bacteraemia due to this pathogen in a patient with SLE without skin or endocardium involvement.

Keywords: *Erysipelothrix rhusiopathiae*; systemic lupus erythematosus (SLE); bacteraemia.

INTRODUCTION

Erysipelothrix rhusiopathiae is a Gram-positive, facultatively anaerobic bacillus. It was first isolated from mice and it is widespread in nature as a commensal of many domestic and wild animals, as fishes, birds, and even insects [1]. *Erysipelothrix rhusiopathiae* was initially identified as the causative agent of swine erysipelas [2, 3]. Later, at the beginning of the last century, it was reported as a human pathogen [4]. Infections due to *E. rhusiopathiae* have a worldwide distribution. Most human cases are related to occupational exposure (fishermen, fish handlers [including aquariums], butchers, veterinarians, slaughterhouse workers in general, trappers, housewives, etc) [1, 5]. Human infections are usually classified into three well-defined groups:

- 1) a mild localized cutaneous form (so called "erysipeloid"),
- 2) a generalized cutaneous form,
- 3) an invasive septic form, usually associated with endocarditis [6].

Only exceptionally the septic form involves sterile sites other than endocardium, usually bones and joints [7-12].

Systemic lupus erythematosus (SLE) is an autoimmune disease characterized by diverse clinical manifestations, multi-organ involvement and unpredictable course [13]. As of today, SLE remains a very complex disease, that requires very skilled and highly trained physicians for a correct clinical evaluation and diagnosis, and for deciding the most suitable therapy in every single patient [14]. Actually, no "typical" SLE patient exist and patients may present with different pathogenetic and clinical profiles, requiring diverse and rather individualized therapeutic approaches, to obtain the best clinical outcome. In any case, treatment is based on immunosuppressive drugs, *i.e.* steroids, cyclophosphamide, mycophenolate, belimumab or others. Therefore, patients with SLE are subject

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to more frequent infections and in particular to infections to unusual pathogens [15, 16].

To our knowledge this is the first report of isolated septicaemia due to *Erysipelothrix rhusiopathiae* in a patient with SLE.

■ CASE REPORT

The patient was a 45-year-old woman from Northern Italy living in a large town near the sea. She had been affected by SLE for the previous 25 years, treated with cyclosporine 150 mg daily and methylprednisolone 24 mg daily.

In the two weeks before presenting to the Emergency Room (ER) of our Institution, she suffered from three distinct episodes of fever (up to 39°C) with chills (14, 6 and 4 days before).

She presented to the ER for a fourth episode of fever (40°C). Then she was admitted from the ER to the Infectious Diseases unit of our Institution. At admission to our unit no fever was observed.

Four days after admission she presented again fever and patient's blood was taken for culture. As per protocol, samples were incubated in aerobic and anaerobic conditions. It took four days for *Erysipelothrix rhusiopathiae* to grow; it was then identified by means of API Coryne (bioMérieux, Italy). The isolate was resistant to vancomycin and penicillin, while being susceptible to ceftriaxone, clindamycin, ciprofloxacin and meropenem. On the same day, a total-body CT scan showed a small low-density pancreatic collection (an 18 mm collection between pancreatic head and body) with corpuscle material suspect for an infectious localization.

After blood cultures were taken, the patient started empiric antibiotic treatment with intravenous levofloxacin (500 mg daily). Since the strain was susceptible to the ongoing treatment, levofloxacin was continued.

The patient steadily improved her clinical conditions (disappearance of fever one day after starting antibiotic) and reactive-C protein dropped from 8.9 mg/dL (normal value 0-0.5 mg/dL) at admission to 0.5 after 7 days of antibiotic treatment.

In consideration of the high frequency of endocardium involvement in invasive *Erysipelothrix* infections, echocardiography was performed but no sign of endocarditis could be identified. No skin lesion was present as well.

After 7 days of intravenous antibiotic treatment the patient was shifted to oral treatment with the same antibiotic; then she left the hospital and continued oral treatment with levofloxacin for a total of 4 weeks of antibiotic treatment.

The patient fully recovered at the end of the antibiotic treatment.

The patient underwent nuclear magnetic resonance of the abdomen about 6 weeks after the end of antibiotic treatment and no pancreatic collection was detected.

The patient's history was re-evaluated but no "typical" risk factor for *Erysipelothrix* infection was identified, *i.e.* working, home or leisure activities that could be correlated [1]. Since there are case reports from people who had been in contact with raw seafood or uncooked meat, our patient could have acquired the infection from exposure of her skin while preparing or cooking meat or fish [17, 18].

■ DISCUSSION

We described a rare invasive *Erysipelothrix* infection and - to our knowledge - this is the first report of septicaemia due to *Erysipelothrix rhusiopathiae* without skin or endocardium involvement in a patient with SLE [17].

The impaired cellular and humoral immune functions seen in patients with SLE are predisposing conditions, and disease activity, prednisone doses over 7.5-10 mg/day, high doses of methylprednisolone or cyclophosphamide are well-recognised risk factors for infection. And infection is one of the leading causes of morbidity and mortality in SLE. On the other side immunosuppression has been recently acknowledged as a risk factor for *Erysipelothrix* [19].

Although no "typical/classical" risk factor for *Erysipelothrix* infection was identified, it is known that this unusual pathogen is able to persist for long periods in the environment and survive in marine locations, as well to contaminate raw fish or meat. No endocarditic involvement - frequent in invasive *Erysipelothrix* infection - was detected. Nevertheless, it is probable that the observed pancreatic collection was a secondary localization of this invasive *Erysipelothrix* infection.

Empiric antibiotic treatment with levofloxacin was very effective and early clinical improvement was observed.

In particular, there are only few case reports of infections due *Erysipelothrix rhusiopathiae* in SLE patients [17, 20].

Noteworthy, it was possible to grow the agent of the bacteraemia. This underlines the importance of performing blood cultures in patients with fever, possibly before starting antibiotic treatment and to allow time for growth of slow growing bacteria before declaring them negative (at least 7 days) [1, 12].

Although *Erysipelothrix* invasive infections are rarely reported, they may be under-diagnosed (and thus under-reported) because of the resemblance they bear to other infections and the challenges that may be encountered in isolation and identification of this pathogen [18]. Nevertheless, there is growing interest in reporting cases of *Erysipelothrix* invasive infections with more than 50 cases published during recent years [5, 10, 12, 17, 19-21].

In conclusion, *Erysipelothrix rhusiopathiae* is an old and rarely identified pathogen, and it can cause serious infections, but it is still far from being fully known and characterized. In this regard, it would be useful to further increase the number of reports of *Erysipelothrix* infections for a better understanding and characterization of the clinical manifestations caused by this pathogen.

In addition, we can summarize that unexpected/unusual pathogens should be considered in serious infections in SLE patients, especially if under immunosuppressive treatment.

Conflict of interest

The authors declare no conflict of interest

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