

Recurrent Sepsis Due To *Bacillus Licheniformis*

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ABSTRACT

Bacillus licheniformis is recognized as a human pathogen causing infections, mainly in immunocompromised patients. We present a case of sepsis in an immunocompetent patient, caused by *B. licheniformis*. This case is of particular interest because the patient had no history of any immune deficiency and the disease did not respond to antibiotic treatment.

Key words: *Bacillus licheniformis*, Polyresistant strain, Sepsis

INTRODUCTION

Bacillus licheniformis is an aerobic, Gram-positive, spore-forming rod, and is ubiquitous in the environment. *B. licheniformis* is increasingly recognized as a human pathogen and causes serious infections, mainly in immunocompromised patients. It was isolated in cases with bacteremia,^[1-4] peritonitis,^[5,6] food poisoning^[7] and eye infections.^[8,9] Santini *et al.* reported a case of endocarditis in an immunocompetent patient, but the patient was a 73-year-old man with an aortic valve replacement.^[10]

Ozkocaman *et al.*^[3] reported *Bacillus* spp. in patients with hematological malignances, and *B. licheniformis* was isolated from 7 out of 12 patients (58.33%).

CASE REPORT

We present a case of sepsis and arthralgia in an immunocompetent patient. A 41-year-old woman was admitted to hospital with fever of 38.5–39°C, with severe pains, predominantly in the large joints. She experienced easy fatigability, dry racking cough, nocturnal sweating, shortness of breath, retrosternal oppression and tachycardia.

The patient reported that 2 weeks before she had diarrhea

for 5 days. She did not remember what she had eaten and did not undergo any treatment. She denied any serious diseases and manipulations or conditions that could have presented her as immunocompromised. At the time when she was with diarrhea, as well as following that period, she was subfebrile.

The radiographic examination did not reveal active pulmonary disease. After performing the necessary investigations, we interpreted the cardiac syndrome as toxoallergic myocarditis. Among the numerous laboratory tests made, only the accelerated ESR – 45/75, was relevant. Immunoglobulins, as well as CD3, CD4 and CD8 were within normal limits. Treatment with cephtriaxon was initiated.

Bacillus licheniformis was isolated from the haemoculture and processed/identified by BD BACTEC™ FX Blood Culture System. The strain showed susceptibility to gentamycin, kanamycin, amikacin, carbenicillin, chlornitromycin and carbapenems.

Amikacin treatment with daily dose of 25 mg/kg was applied for 7 days and the patient rapidly became afebrile. She was discharged but 3 weeks later she presented with the same complaints and lower temperature – 37.6°C - 38°C, and was readmitted to the hospital. Once again, *B. licheniformis* was isolated from two hemocultures.

Meanwhile, the strain had remained susceptible only to amikacin and carbapenems. Following a 7-day imipenem treatment at a dose of 1 g twice daily, the hemocultures remained sterile, the complaints subsided and the patient was discharged.

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After 34 days, the patient was readmitted to the hospital with persistent subfebrile temperature, joint pains, retrosternal oppression and tachycardia. The only relevant laboratory test was the accelerated ESR (28/48). Once again, *B. licheniformis* was isolated from two consecutive hemocultures. A 10-day meropenem treatment at a dose of 1 g three times daily was given. One week later, her hemocultures became sterile and her complaints subsided, and she was discharged.

The case we have reported here is of particular interest for the following reasons: a) For 110 days, the patient's condition was characterized by alternating exacerbation and subsiding of the following symptoms—febrility, nocturnal sweating, dry spastic cough, tachycardia, and allergic swelling of the eyelids. b) The complaints started after food poisoning, and later on the symptoms were consistent with the clinical picture of sepsis caused by *B. licheniformis*. c) There was no history of any immune deficit, use of immunosuppressors, presence of neoplasm, stress, etc. The immunological investigations were within normal limits. Most cases of pathologic processes caused by *B. licheniformis* and reported in literature were observed in immunocompromised patients. d) The organisms, although not found in blood between the disease recurrences, were likely to be persistent in other tissue or in the bone marrow, where they remained dormant. Hannah and Ender described a case of persistent *B. licheniformis* bacteremia and suggested that spores of *B. licheniformis* remained in the tissue.^[11] The possibility of *B. licheniformis* persisting as dormant endospores, unaffected by antimicrobials in the intestine, could represent a potential pathway by which periodically germinating spores could be able to cause recurrent infection. e) The disease did not respond to the antibiotic treatment based on the data from the antibiogram and recurrent sepsis occurred despite the application of standard schemes and using antibiotics. f) In the meanwhile, the strain became polyresistant and the last isolates were susceptible to carbapenems only. It is likely that recurrent sepsis may have been avoided if carbapenems or a combination of two different antibiotics had been used during the first stay of the patient in hospital.

CONCLUSION

To conclude, whenever Gram-positive spore-forming rods are isolated from feces and hemocultures, they have to be strictly identified and their participation in a pathologic process should be followed closely by both a clinician and a microbiologist.

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