



Short communication

Septic shock due to *Clostridium tertium* in an immunocompetent patient following colitis without inflammatory bowel disease



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1. Introduction

The clostridium genus encompasses a diverse group of anaerobic, gram-positive, spore-forming bacteria found in human and animal gastrointestinal tracts, in the commensal flora of the mouth, and most frequently in soil [1].

Clostridium tertium, a non-exotoxin producing an aerotolerant agent is part of this group and considered as a weak pathogen. Despite its unclear pathogenicity, several cases of severe bacteraemia caused by *C. tertium* have been reported. However these cases were always linked to a predisposing factor, such as neutropenia in most reports, and less frequently, previous exposure to beta lactam antibiotics and intestinal mucosal injury [2]. We hereby report a rare case of *C. tertium* bacteraemia in a healthy adult presenting with acute colitis.

2. Case report

A 54-year-old Caucasian female presented to the ED of a community hospital with diffuse abdominal pain, nausea, vomiting, distended abdomen, fever and chills. She had normal bowel movements. The patient reported no relevant previous illnesses, with the exception of an irritable bowel syndrome, for which she had never been hospitalized, nor treated. She had normal hepatic and renal functions. A CT-scan showed a thickened, oedematous

large bowel mucosa with a reduced lumen. There were no signs of ascites or free air in the abdomen. The patient was discharged on 500 mg of oral ciprofloxacin q12 h, and pain medication.

Two days later, she presented to our institution with worsening symptoms. She was still febrile (38.5 °C). Her blood pressure was 120/70 mmHg, and her heart rate 100 b/min. On physical examination, she had a distended abdomen, with rebound tenderness in the right lower quadrant. Her clinical examination was otherwise normal. A repeat CT-scan showed a thickened oedematous right large bowel mucosa and terminal ileum with a reduced lumen and proximal intestinal dilatation. Laboratory tests showed the following:

- haemoglobin (Hb): 11.6 g/dl;
- white blood cell count (WBC): 4000/μl (90% neutrophils);
- platelets: 170 000/ml, creatinine: 144 μmol/l, CRP: 295 mg/l.

A few hours later, she became hypotensive with a systolic blood pressure at 65 mmHg that responded to fluid replacement. She was transferred to the ICU.

A complete bacterial screening was performed, including blood, urine, stool sputum, and nose cultures. Blood cultures were repeated every 6 h as long as fever was above 38.5 °C. She was started on broad-spectrum IV antibiotics with imipenem (500 mg q 8 h), ciprofloxacin (400 mg q 12 h), and vancomycin (1 g q 12 h). Haemodynamic stability was achieved for 24 h, but she remained febrile with spikes reaching 40 °C. Wright and Widal tests, PP65 antigen and clostridium toxins were all negative. Immunoelectrophoresis of plasma proteins ruled out any immunodeficiency disorder.

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Aeromonas hydrophilia sensitive to imipenem and resistant to Ciprofloxacin was isolated on the first blood culture taken, and Ciprofloxacin was replaced with azactam (1 g q8 h).

However, the patient kept deteriorating and progressively developed severe septic shock with ARDS 48 h following admission. She was put on vasoconstrictors, intubated and completely sedated. Laboratory tests indicated a WBC at 2900/ μ l (with 85% neutrophils); CRP was 400 mg/l and creatinine 172 μ mol/l. A chest, abdomen and pelvis CT-scan confirmed ARDS with diffuse patchy alveolar infiltrates and regression of intestinal signs. Nine separate blood cultures revealed a gram-positive bacillus that turned out to be *C. tertium* with in vitro sensitivity to penicillin and vancomycin, but resistant to clindamycin. The antibiotic regimen had to be changed accordingly, and azactam was replaced with ampicillin (1 g q 12 h). Imipenem 500 mg/8 h and vancomycin 1 g/12 h were continued. The fever subsided 24 h following the first dose of ampicillin, and the patient improved afterwards. She was extubated on day 14 and discharged from the hospital on day 21 after a total course of 14 days of ampicillin, 18 days of vancomycin, and 21 days of imipenem. A colonoscopy and terminal ileoscopy performed on day 18 were completely normal. Histological analysis was normal.

3. Discussion

C. tertium was initially isolated in 1917 by Henri, from soldiers' wounds in World War I, and it was isolated as a human pathogen in 1963 when the first case of infection was reported [2]. While certain authors shed some doubt on the clinical significance of *C. tertium* as a pathogen, fatal cases have been reported [1,2].

Bacteraemia in non-neutropenic patients has rarely been described and most cases of *C. tertium* have been reported in neutropenic patients. Intestinal mucosal damage has been suggested to be one of the major risk factors for bacteraemia due to *C. tertium*. The third factor associated with *C. tertium* bacteraemia is history of exposure to β -lactam antibiotics, particularly third generation cephalosporins and to aminoglycosides [2].

In a recent review of 32 cases collected between 1992 and 1999, 3 patients were non neutropenic and had probable intestinal mucosal injury as a trigger for *C. tertium* bacteraemia. The first patient had end-stage liver disease secondary to chronic alcohol abuse and presented with spontaneous bacterial peritonitis. The second patient had systemic lupus erythematosus treated with high doses of steroids, and had a percutaneous gastrostomy tube placed 3 days before isolation of *C. tertium*. The third patient suffered from Crohn's disease [2]. Three other reports of *C. tertium* bacteraemia in non-neutropenic patients have been described in patients with pancreatitis [3], acute bronchopneumonia after ingestion of glyphosate herbicide [4], and a fatal case of postoperative *C. tertium* septicaemia with mechanical ileus [5].

C. tertium has also been reported in bone and soft tissue infections in non immunocompromised patients [1].

In the patient we report herein, the initial presentation and imaging were suggestive of colitis, which could have been a trigger for *C. tertium* bacteraemia secondary to bacterial translocation [2,5].

C. tertium is commonly resistant to many β -lactam antibiotics, clindamycin, and metronidazole but is usually sensitive to vancomycin, trimethoprim-sulfamethoxazole, imipenem and ciprofloxacin [1]. Sensitivity to penicillin has been reported in some patients [3]. This was the case in our patient who developed septic shock with ARDS while being on ciprofloxacin, imipenem and vancomycin, and only improved significantly after starting penicillin. *C. tertium* was detected only after the patient had developed severe bacteraemia. There is no consensus in the literature about the choice of antibiotic treatment and its duration. Most regimens include two or three antibiotics and duration of antibiotherapy is not clear but varies from 15 to 27 days [1,3].

4. Conclusion

We describe a case of *C. tertium* bacteraemia in a non-neutropenic patient following colitis without inflammatory bowel disease. The patient developed septic shock with ARDS, despite broad-spectrum antibiotics, and only responded to penicillin. *C. tertium* bacteraemia can be life threatening even in immunocompetent patients.

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Disclosure of interest

The authors declare that they have no competing interest.

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