

Clostridium perfringens bacteremia associated with colorectal cancer in an elderly woman

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Dear Editor,

Clostridium perfringens bacteremia is rare and mostly occurs in older people. The most common source is intra-abdominal infection, and the presentation is often non-specific. Patients with hepatobiliary diseases, renal insufficiency, or malignancies are at higher risk of acquiring this infection. The mortality rate is high, and thus, early diagnosis with prompt antibiotic therapy is important (1-3).

A 73-year-old female painter with a history of hypertension was presented to the emergency department with intermittent fever and chills for 3 days. The associated symptoms were lower abdominal cramps and diarrhea. She denied eating raw meat or poultry in the past week. None of her contacts were febrile, and she had not travelled recently. On examination, the patient's temperature was 39.5°C, her blood pressure was 160/83 mmHg, her heart rate was 83 beats per minute, and her respiratory rate was 20 breaths per minute. The patient was well-nourished and awake with alert consciousness. Her neck was supple, without palpable lymphadenopathy. The breathing sounds were normal. The cardiac rhythm was regular without murmur. Bowel sounds were present, and the abdomen was soft and non-distended, but tenderness of lower abdomen was noted on palpation. There was no leg edema. There was no open wound or surgical scar over her body.

Initial blood tests showed white blood cell count of 19100/ μ L, with 84.9% neutrophils, 2.5% lymphocytes, 4.2% monocytes, and 8.4% bands. Her hemoglobin was 7.9 g/dL, and mean corpuscular volume was 59.7 fL. Her random plasma glucose was 229 mg/dL. Blood chemistry showed creatinine of 0.65 mg/dL, alanine aminotransferase of 28 U/L, C-reactive protein of 7.93 mg/dL,

and lactate of 71.5 mg/dL. Urinalysis showed borderline pyuria with urine WBC of 34/ μ L. There was no remarkable finding of chest radiograph and plain abdominal radiograph. Other laboratory results included a negative rapid influenza diagnostic test and a positive fecal occult blood test. Blood transfusion with leuko-reduced packed red blood cells 4 units was given, and she was admitted to our geriatric medicine ward.

Under the tentative diagnosis of infectious colitis, ceftriaxone was administered in the first two days, which was subsequently changed to ciprofloxacin for another three days because fever had not resolved. The abdominal ultrasound found a gallbladder stone with a size of 2.7 cm, without wall thickening. The echocardiogram showed no remarkable finding. It was not until the fourth day of admission when three sets of blood culture grew *Clostridium perfringens* that the antibiotic therapy was changed to meropenem. Only one set is polymicrobial bacteremia with growth of *Streptococcus sanguis*. The antibiotic was down-escalated to ampicillin-sulbactam later based on the antibiotic sensitivity tests. Fever and diarrhea resolved on the eighth day of admission. Anemia was further surveyed by colonoscopy, which revealed a sigmoid colon tumor 5 cm in diameter, histologically proved to be an adenocarcinoma. Abdominal computed tomography (CT) and fluorodeoxyglucose-positron emission tomography (FDG-PET) revealed that the clinical stage was T4bN1M1, with local invasion to pericolic region, uterus, and lymph nodes, and metastasis to liver. Tumor markers showed elevated CA 125 of 75.0 U/mL, but normal CEA of 1.28 ng/mL. After a full course of ampicillin-sulbactam, she was discharged with afebrile state. Then, she received chemotherapy and targeted therapy at the hematology out-patient department. A salvage surgery was performed five months after she was discharged.

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Clostridium perfringens is a Gram-positive and anaerobic bacillus, which is known as a foodborne pathogen. However, the patients who are infected may exhibit as soft tissue infection, gastroenteritis, liver abscess, bacteremia, and septic shock. *Clostridium perfringens* bacteremia is rare and considered as an age-related disease. The mean age of the patients were over 70 years old in two case series of Asian countries (1, 2). Intra-abdominal infections are the most common source, accounting for half cases, followed by respiratory tract infections (1). However, the bacteremia can also be primary. Elderly patients with hepatobiliary diseases, renal insufficiency, and malignancies are at higher risk of acquiring *Clostridium perfringens* bacteremia (1-3). Of all the malignancies, gastrointestinal and genitourinary systems are the most common sites (1, 3), and the cause may also be related with intervention of neoplasms. The clinical presentation of *Clostridium perfringens* bacteremia is often non-specific, which includes fever, abdominal pain, and less frequently, change of consciousness. The laboratory tests may reveal a picture of systemic inflammatory response syndrome, such as anemia, leukocytosis, liver dysfunction, or thrombocytopenia (1). Half of the cases are polymicrobial bacteremia, with the most common concurrent organisms being *Escherichia coli* and *Klebsiella pneumoniae*. The detection rate of *Clostridium perfringens* is much higher in the anaerobic culture. However, bacterial growth is relatively slow in anaerobic bottles. This makes early diagnosis as well as prompt antimicrobial therapy challenging.

Most patients with *Clostridium perfringens* bacteremia can be managed by proper antibiotic agents, but around one third of patients need further treatment in intensive care units (1). The mortality rates had been reported to be approximately 27-48% (1, 3). Several antibiotic agents were reported to be effective, such as penicillin and its derivatives, clindamycin, and metronidazole, though resistance of *Clostridium* species to clindamycin had emerged.

In our case, one of the three positive blood cultures grew *Streptococcus sanguis* concurrently. *Streptococcus sanguis* is an α -hemolytic Gram-positive coccus, which resides in oral cavity and gastrointestinal tract. It rarely causes bloodstream infection, and it is less commonly

known than *Streptococcus bovis* to be associated with colorectal cancer. Only few case reports suggested an association between *Streptococcus sanguis* bacteremia and colorectal malignancies (4, 5).

In conclusion, we report a case of *Clostridium perfringens* bacteremia in relation to colorectal cancer. To our knowledge, this is the first case of polymicrobial bloodstream infection with *Clostridium perfringens* and *Streptococcus sanguis* resulting in workup and diagnosis of colorectal cancer in an older patient. The care provider should be aware of colorectal malignancies in older people with an unusual bacteremia.

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