**Bacteroides Thetaiotaomicron** Sepsis in an Elderly Patient with Ischemic Bowel Disease

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Bacteroides thetaiotaomicron, a gram-negative anaerobic bacterium, belongs to the genus Bacteroides. It is always considered as the normal floras of the gastrointestinal tract, oral cavity, vagina, and respiratory tract, however, it associated human infections are rarely reported. An 84-year-old woman presented with progressive lower abdominal pain and fever for one day. Abdominal X ray revealed ileus. Computed tomography of abdomen disclosed diffuse small bowel wall thickening with intramural air at distal ileum and ascites, which was consistent with ischemic bowel disease. Antibiotic was switched to imipenem and metronidazole, and continuous renal replacement therapy was applied for refractory metabolic acidosis. In the meanwhile, two sets of bacterial culture of blood yielded B. thetaiotaomicron. Her family refused surgical intervention, and finally, she died on hospital day 4. In conclusion, we report a fatal case of B. thetaiotaomicron bacteremia developed in an elderly patient with ischemic bowel disease. This case expands the spectrum of infection caused by B. thetaiotaomicron, and raises the possibility of B. thetaiotaomicron as one of the causes of intra-abdominal infections.

Key words: Bacteroides thetaiotaomicron, sepsis, ischemic bowel disease

**Introduction**

*Bacteroides thetaiotaomicron* is a gram-negative anaerobic bacterium, and belongs to the genus Bacteroides. Bacteroides species are one of the most common pathogens of human commensal anaerobes, which colonize the mucous membranes. Although it is usually recognized as the normal floras of the gastrointestinal tract, oral cavity, vagina, and respiratory tract, human infections caused by *B. thetaiotaomicron* are rarely reported¹⁷. Herein, we described one case of *B. thetaiotaomicron* bacteremia secondary to ischemic bowel disease in an elderly woman.

**Case Report**

An 84-year-old woman visited the emergency department for lower abdominal pain and fever for one day. She denied any significant medical history. Her body temperature was 38.6°C, pulse rate was 120 per minute, and blood pressure was 129/76 mmHg. Physical examinations were unremarkable except mild lower quadrant tenderness without rebounding pain. The results of laboratory examinations were as follows: white blood cell count (WBC), 4,400/mm³ (86.3% neutrophils); and C-reactive protein, 210.1 mg/l (normal reference < 6 mg/l). Urinary analysis showed WBC was...
10-19 per high power field. Empirical antibiotic with cefazolin (1 gm every 8 hour) was intravenously administered after collecting specimens of blood and urine for culture. Three days later, progressive abdominal pain with hypotension and dyspnea developed during hospitalization. Repeated laboratory examinations showed WBC 10,600/mm$^3$ (89% neutrophils) and lactate 9.1 mmol/L. Arterial blood gas showed metabolic acidosis and hypoxemia. Abdominal X ray revealed ileus. Computed tomography of abdomen disclosed diffuse small bowel wall thickening with intramural air at distal ileum and ascites, which was consistent with ischemic bowel disease (Fig. 1). Then emergent intubation, and fluid resuscitation with inotropic agent were done after transferring to intensive care unit. Antibiotic was switched to imipenem and metronidazole, and continuous renal replacement therapy was applied for refractory metabolic acidosis. Her family refused surgical intervention, and finally, she died on hospital day 4. In the meanwhile, two sets of bacterial culture of blood yielded Gram-negative bacteria, which were further confirmed as B. thetaiotaomicron. Antibiotic susceptibility tests revealed that B. thetaiotaomicron was sensitive to metronidazole, but resistant to chloramphenical, clindamycin and penicillin.

Discussion

Here, we demonstrated a fatal cause of B. thetaiotaomicron sepsis developed in an elderly patient with ischemic bowel disease. As B. thetaiotaomicron is an enteric bacterium, the portal of entry of B. thetaiotaomicron was supposed to be associated with intra-abdominal pathology – intestinal ischemia. Transmural migration of B. thetaiotaomicron developed through the diseased intestine and caused severe bacteremia. B. thetaiotaomicron is one of the members of the Bacteroidaceae family, which also includes Bacteroides fragilis, Bacteroides distasonis, Bacteroides ovatus, Bacteroides thetaiotaomicron, and Bacteroides vulgatus. Within this group, B. fragilis was the most common pathogen causing human infections. In contrast, B. thetaiotaomicron associated clinical infections were rarely reported, and most of them presented as case reports$^{(2-7)}$. Based on the review of literature, the limited clinical experience of B. thetaiotaomicron infections showed this uncommon pathogen.

Fig. 1  Computed tomography of abdomen disclosed diffuse small bowel wall thickening with intramural air at distal ileum and ascites
ever caused peritoneal-dialysis peritonitis, meningitis and polymicrobial sepsis\(^{(2-7)}\). These rare infections can develop in patients with leukemia, liver cirrhosis and end stage renal disease\(^{(4-7)}\). In our patient, she did not have underlying immunocompromised condition which made her get infections caused by original normal enteric flora - \textit{B. thetaiotaomicron}. The old age may be one of the predisposing factors for this opportunistic infection.

In our case, we used antibiotics with metronidazole and imipenem, which showed in vitro susceptible to \textit{B. thetaiotaomicron}, but the clinical condition still got worse. The mortality should mainly be due to the lack of surgical intervention and critical illness, and partly due to initial inappropriate antibiotic with cefazolin. However, anti-anaerobes antibiotic should be considered in the clinical setting of intra-abdominal infections, and clinicians should consider \textit{B. thetaiotaomicron} as possible pathogens.

According to previous study\(^{(8)}\) about the in vitro activity of various antibiotics against 30 clinical isolates of \textit{B. thetaiotaomicron}, all of the isolates were susceptible to imipenem, and metronidazole, and 90\% of them were susceptible to amoxicillin-clavulanate. In contrast, only 57\% and 33\% of isolates were susceptible to clindamycin and cefoxitin\(^{(8)}\). Despite in vitro activity cannot represent in vivo response, anti-anaerobe antibiotics such as metronidazole and imipenem still can be recommended as appropriate antibiotic for this pathogen.

In conclusion, we report a fatal case of \textit{B. thetaiotaomicron} bacteremia developed in an elderly patient with ischemic bowel disease. This case expands the spectrum of infection caused by \textit{B. thetaiotaomicron}, and raises the possibility of \textit{B. thetaiotaomicron} as one of the causes of intra-abdominal infections.

**Conflicts of Interest**

The authors do not have any conflicts of interest to declare.

**References**

西塔類桿菌引起老年人缺血性腸壞死及敗血症

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西塔類桿菌是革蘭氏陰性的厭氧細菌，屬於類桿菌屬。它總是被當作是腸胃道、口腔、陰道和呼吸道的正常菌屬，因而它與人類的感染是很少被報導。一位八十四歲的婦人表現漸進性的下腹痛和發燒已有好幾天，腹部X光現腸阻塞，腹部電腦斷層顯示小腸壁肥厚並在遠端迴腸壁內有氣體及混濁的腹水，此現象和缺血性腸壞死有一致的表現。由於頑固性的代謝性酸中毒，所以給予持續性洗腎治療和更換抗生素成imipenem和metronidazole。同時，兩套血液培養是長出西塔類桿菌。由於她的家屬拒絕開刀建議，最後她住院第四天死亡。我們提出一例西塔類桿菌引起老年人缺血性腸壞死的死亡病例，此病例顯示西塔類桿菌也是有可能造成腹內感染。

關鍵詞：西塔類桿菌，敗血症，缺血性腸壞死