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Case Report

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Delftia Acidovorans Peritonitis in a Patient Undergoing Peritoneal Dialysis

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Abstract

Peritonitis is the most common complication of peritoneal dialysis. Peritoneal dialysis associated peritonitis caused by *Delftia acidovorans* has been reported only once in the literature before. Here, we present the second case of *D. acidovorans* peritonitis in a 60-year old male patient undergoing peritoneal dialysis. The patient was treated with intraperitoneal ceftazidim and oral ciprofloxacin, to which the organism was sensitive. The catheter was removed because of refractory peritonitis.

Keywords: *Delftia acidovorans,* end-stage kidney disease, peritoneal dialysis, peritoneal dialysis-associated peritonitis

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INTRODUCTION

Bacterial peritonitis is the most common complication encountered in peritoneal dialysis. *Delftia acidovorans (D. acidovorans)* is a gram-negative aerobic bacteria found in soil and water (1). It has rarely been implicated in serious human infections (2). We report a peritoneal dialysis associated peritonitis case caused by *D. acidovorans*.

CASE PRESENTATION

A 60-year-old male patient undergoing peritoneal dialysis was admitted owing to inadequate ultrafiltration and cloudy dialysate for the last 3 days. He was diagnosed with end-stage kidney disease caused by diabetic nephropathy 3 years ago and started peritoneal dialysis after a short course of hemodialysis. On physical examination, his abdomen was distended and tender, there were no signs of peritoneal catheter exit site infection. His laboratory analysis revealed a dialysate white blood cell (WBC) count of 2,050/mm^3, a blood WBC count of 12,950/mm^3, and a C-reactive protein (CRP) level of 5.90 mg/dL (normal value is <0.5 mg/dL). Peritonitis was diagnosed. Culture samples of dialysate were inoculated in aerobic and anerobic blood culture bottles and an intraperitoneal empiric antibiotic treatment with 1 g of cefazol and 1 g of ceftazidim daily was started. Gram-negative bacilli were visualized on dialysate Gram stain. On day 2, dialysate WBC count was found to be 760 cells/mm^3. Cefazol was stopped and ceftazidim was continued. His abdominal pain resolved, and the peritoneal fluid became clear. But the dialysate WBC count increased dramatically from 760 cells/mm^3 to 8,200 cells/mm^3 on the fourth day. New peritoneal fluid culture samples for both bacteria and fungi were obtained. *D. acidovorans* grew in the aerobic blood culture bottle on the fifth day and on routine agar media on the sixth day of the treatment. There was no growth detected in the anaerobic bottle. The bacteria were resistant to aminoglycosides and colymicin and sensitive to kinolons, ceftazidim, and trimethoprim/sulphamethoxazole. Oral ciprofloxacin 500 mg/day was added to the treatment. On the next day, after the treatment was changed, the peritoneal fluid

WBC count decreased to 460 cells/mm^3. His CRP levels showed a sustained decrease and normalized on the 14th day of the treatment. His symptoms did not recur. The WBC counts on the consequent dialysate samples were found to be between 120 and 200/mm^3 cells, but a peritoneal fluid WBC count of less than 100/mm^3 was never achieved. Despite the clinical and laboratory improvement, the infectious agent could not be totally eliminated with medical treatment. The peritoneal catheter was removed on the 15th day because of refractory infection. The patient started chronic hemodialysis 3 times a week. The antibiotic treatment was given via intravenous infusion for 7 more days and was ended on day 21. On his last follow-up the patient was doing well.

DISCUSSION

D. acidovorans, formerly known as *Comomanas acidovorans* is a gram negative, aerobic bacillus, which is classified in the *Pseudomonas* rRNA homology group (1). It is ever-present in water and soil (2). Although *D. acidovorans* is generally regarded as an organism of limited virulance and seen usually as a nonpathogen, serious infections like empyema, infective endocarditis, and pneumonia have been reported in immunocompotent and immunocompromised hosts (3-6).

Besides these infections mentioned above, *D. acidovorans* also causes arterial and venous catheter related infections. There are previous reports of vascular catheter related *D. acidovorans* bacteremia (7-11).

Among the scarce reports of clinically important *D. acidovorans* infections, peritoneal dialysis associated peritonitis is extremely rare. The first case of peritonitis caused by *D. acidovorans* infection in a patient undergoing peritoneal dialysis was reported in 1993 by Lopez-Menchero et al. (12). The patient had simultaneous peritonitis and exit site infection. Cultures of peritoneal fluid and exit site were positive for *D. acidovorans*. Our patient had no signs of exit site infection. The source of the peritonitis remained unknown. *D. acidovorans* grew in 2 seperate peritoneal fluid cultures. Lopez-Menchero's patient was treated with intraperitoneal ceftazidime and oral ciprofloxacin for 28 days. The peritoneal catheter was left in place. The infection relapsed after 1 week. Treatment with intraperitoneal ceftazidime and oral ciprofloxacin was restarted and the antibiotic treatment was continued for 28 days. The infection relapsed again after 1 week of the end of the second antibiotic course. The catheter was removed because of relapsing peritonitis. Like Lopez-Menchero's patient, our patient had a mild clinical course and his condition improved with antibiotic treatment quickly. His abdominal pain disappeared and peritonel fluid WBC counts decreased. But a cell count with fewer than 100 cells/mm^3 was never shown despite appropriate antibiotic combination treatment. We suggested that the infection could not be eradicated by medical treatment only. The catheter was removed due to refractory infection on the 15th day of the antibiotic treatment.

As far as we know, our case is the second case of peritoneal dialysis associated peritonitis caused by *D. acidovorans*. It presents many similarities with the first case report of Lopez-Menchero. Because there are only 2 reported cases, it is not possible to draw conclusions about the management of *D. acidovorans* peritonitis. Both infections ended with catheter loss owing to either relapse or refractory peritonitis. According to the International Society for Peritoneal Dialysis (ISPD) guidelines, prompt catheter removal should be considered for relapsing, recurrent, or repeat peritonitis episodes (13).

CONCLUSION

In summary, *D. acidovorans* can cause peritonitis. The peritonitis has a mild clinical course and responds to antibiotics, but it becomes a relapsing or refractory character, which is difficult to eradicate with medical treatment only. Although there are no instructions specifically regarding *D. acidovorans* peritonitis management, the ISPD peritonitis recommendations are directive.

Main Points

- Bacterial peritonitis is the most common complication encountered in peritoneal dialysis.
- *D. acidovorans,* a gram negative, aerobic bacillus, which is classified in the *Pseudomonas* rRNA homology group, is a rare cause of serious human infections, like empyema, infective endocarditis, pneumonia, arterial and venous catheter related infections.
- We report of the second peritoneal dialysis-associated peritonitis case caused by *D. acidovorans*. The bacteria were resistant to aminoglycosides and colymicin and sensitive to kinolons, ceftazidim, and trimethoprim/sulphamethoxazole.
- The patient was treated with ceftazidim and oral ciprofloxacin. The peritoneal catheter was removed because of refractory infection.
- According to the International Society for Peritoneal Dialysis (ISPD) guidelines, prompt catheter removal should be considered for relapsing, recurrent, or repeat peritonitis episodes.

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