## Case Report

# **Citrobacter Freundii Peritonitis in a Patient on Peritoneal Dialysis:** A **Case Report**

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### Abstract

Peritonitis is the most common complication of peritoneal dialysis (PD). This condition is associated with morbidity, catheter loss, transition to hemodialysis and mortality. Gram negative agents are less observed than gram positive factors as a factor [1]. In this article, we presented a case of peritonitis, which is a rare cause of peritonitis caused by Citrobacter freundeii from the enterobacteriaceae family, resulting in peritoneal catheter loss despite sensitive antibiotic treatment.

**Keywords:** Citrobacter freundii, gram-negative organism, PD-related peritonitis

#### Introduction

Despite all the developments, peritonitis is the most common complication of peritoneal dialysis (PD) [1]. The most common etiological factors are gram-positive bacteria. Gram negative bacteria are less common. Citrobacter freundii is a rare factor of peritonitis and its results are poor. It is a gram negative, motile, facultative anaerobe, sports-free, enterobacteriaceae bacillus found in the gastrointestinal tract of humans and other animals [2]. Biofilm formation structured by gram negative agents during peritonitis makes antibiotics less sensitive to factors [3].

#### **Case report**

A 66-year-old female patient who had continuous outpatient peritoneal dialysis (CAPD) for five years due to end-stage renal failure secondary to diabetes was admitted to the clinic with complaints of abdominal pain, nausea, vomiting and blurred peritoneal fluid that began 10 hours ago.

In the physical examination of the patient who had no peritonitis attack in the last two years, temperature was 38.2°C, blood pressure was 100/60 mmHg. The heart rate was 94/min and the abdomen was diffusely sensitive. There was no evidence of infection in the catheter exit

area. In the laboratory results, hemoglobin 7 g/dL, white blood cell count 6620/mm<sup>3</sup>, sedimentation 89 mm/hour, CRP 187.8mg/dL, peritoneal cell count 1600/mm<sup>3</sup>, neutrophil dominance was 100%. No bacteria was seen in gram staining. After peritenael culture, intraperitoneal 1g loading and 4x250 mg maintenance of cefazolin, 16 mg loading and 2x8 mg maintenance of gentamicin treatment was started. At the 48th hour of treatment, 3x2.25 g of piperacillin/tazobactam IV was started due to the fever again. Citrobacter freundii was grown in culture. Treatment was continued because of the sensitivity on the antibiogram. The cell count was 240 after 48 hours and was 20 on the fifth day. The patient was followed up with fluctuations in cell count, and the treatment was completed in 21 days, and the peritoneal catheter was removed. Fistula, graft and catheter that have been tried in the past for hemodialysis for the patient, and due to the absence of vascular access, peritoneal catheter was inserted to the patient again from the right abdomen area after 36 hours. Two years later with this new catheter, it continues to peritoneal dialysis after the treatment of staphylococcus epidermidis and vancomycin.

### Discussion

Peritonitis is still the most important complication of peritoneal dialysis [1]. Gram-positive bacteria are the most common factor, but the results of gram-negative factors may be worse [4]. The International Society of Peritoneal Dialysis (ISPD) SPICE (Serratia, pseudomonas/Pprovidencia, indole positive proteus/acinetobacter/ morganella, citrobacter, enterobacter and hafnia) organisms recommend sensitive bilateral antibiotics for three weeks due to high mortality and morbidity [1,2]. Cephazoline and gentamicin were started as dual antibiotics in the case, piperacilline/tazobactam was switched due to deterioration in clinical findings until culture result was found and it was found sensitive in the antibiogram.

Peritonitis with members of the Enterobacteriaceae family is the most important cause of morbidity and mortality in PD patients. Citrobacter, one of the members of this family, has not been associated with peritonitis until recently. Citrobacter freundii has been associated with urinary or superficial infection and bacteremia, especially in elderly, immunocompromised and hospitalized patients [4,5]. It can be translocated to the circulation in severe peritonitis with changes in bowel habit. Comorbid conditions such as the age of the patient, pressure of the immune system due to chronic renal failure, diabetes mellitus, and coronary artery disease posed a risk for citrobacter.

There was a short-term history of diarrhea and frequent constipation that she did not define precisely. Of 5-10% transmural migration seen in other microorganisms is 45% with citrobacter. Of 46% case series are with diarrhea and/or constipation. Citrobacter peritonitis mortality rate is 18% and dialysis modality has changed by 89% in 12-month follow-up in living patients [4-6]. In the presented patient, peritoneal catheter had to be withdrawn with sensitive antibiotic treatment. A new peritoneal catheter was applied from a different area after 36 hours because no other route was found. During her 2-year follow-up, she continues to peritoneal dialysis.

We presented a case of peritonitis, which is a rare peritonitis agent that develops with Citrobacter freundii and causes peritoneal catheter to be removed. The clinical significance of pathogens such as citrobacter freundii Citrobacter Freundii Peritonitis

appears to increase in the future in patients with compromised immune systems such as kidney failure.

Conflict of interest statement. None declared.

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