

Chryseobacterium indologenes Peritonitis in Continuous Ambulatory Peritoneal Dialysis Patient Treated with Ciprofloxacin: Case Report

Sürekli Ayaktan Periton Diyalizi Hastasında Gelişen Siprofloksasinle Tedavi Edilen
Chryseobacterium indologenes Peritoniti: Olgu Sunumu

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ABSTRACT

Peritonitis in patients receiving continuous ambulatory peritoneal dialysis (CAPD) is one of the most important causes of increased hospital and antibiotic costs, and mortality and morbidity in these patients. Although the majority of peritonitis cases are caused by Gram positive bacteria, sometimes unexpected microorganism can cause peritonitis. *Chryseobacterium indologenes* is a member of the human flora widely found in nature and rarely causes of human infections. In this case report, it is aimed to present 68 year-old male patient with peritonitis due to *Chryseobacterium indologenes* who has been receiving CAPD for two years. The patient responded well to intravenous plus intraperitoneal ciprofloxacin therapy. There was no need to remove the peritoneal dialysis catheter, in this case. *Chryseobacterium indologenes* is an extremely rare cause of peritonitis associated with CAPD. This microorganism-induced peritonitis can be treated successfully with intravenous plus intraperitoneal antibiotics without need for withdrawal of the peritoneal catheter.

Keywords: *Chryseobacterium indologenes*; continuous ambulatory peritoneal dialysis; ciprofloxacin; peritonitis.

ÖZ

Sürekli ayaktan periton diyalizi (SAPD) alan hastalarda peritonit, artan hastane ve antibiyotik maliyetleri ile bu hastalarda mortalite ve morbiditenin en önemli nedenlerinden biridir. Peritonit vakalarının çoğuna Gram pozitif bakteriler neden olmasına rağmen, bazen beklenmeyen mikroorganizmalar peritonite neden olabilir. *Chryseobacterium indologenes*, insan florasının doğada yaygın olarak bulunan bir üyesidir ve nadiren insan enfeksiyonlarına neden olur. Bu olgu sunumunda, iki yıldır SAPD alan *Chryseobacterium indologenes*'e bağlı peritonitli 68 yaşında erkek hastanın sunulması amaçlanmıştır. Hasta intravenöz ilaveten intraperitoneal siprofloksasin tedavisine iyi cevap verdi. Bu durumda, periton diyalizi kateterinin çıkarılmasına gerek kalmadı. *Chryseobacterium indologenes* SAPD ile ilişkili, oldukça nadir görülen bir peritonit nedenidir. Bu mikroorganizma kaynaklı peritonit, periton kateterinin çekilmesine gerek kalmadan intravenöz artı intraperitoneal antibiyotiklerle başarılı bir şekilde tedavi edilebilir.

Anahtar kelimeler: *Chryseobacterium indologenes*; sürekli ayaktan periton diyalizi; siprofloksasin; peritonit.

INTRODUCTION

Peritonitis in patients receiving continuous ambulatory peritoneal dialysis (CAPD) is one of the most important causes of increased hospital and antibiotic costs, and mortality and morbidity in these patients. Although the majority of peritonitis cases are caused by bacteria (45-60% Gram positive, 15-35% Gram negatives), approximately 3 to 5% fungi can be detected as a responsible microorganism (1). Sometimes unexpected microorganism can be cause of peritonitis belonging to Flavobacteriaceae family, *Chryseobacterium indologenes*, is a Gram negative, glucose-nonfermenting, aerobic, oxidase and catalase positive bacillus. On Gram stain *C. indologenes* may be long, thin, slightly curved, and occasionally filamentous. It grows well and form colonies within 24 hours on blood or chocolate agar and grows

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at a much slower rate, on MacConkey agar (2). They are part of the human flora and widely found in nature. Despite adequate chlorination they can be found in municipal water supplies and in the hospital environment, such as wet surfaces of medical tools and equipment. *Chryseobacterium* species has low virulence, and this microorganism is a rare cause of human diseases and they usually represents colonization not infection. They are resistant to most antibiotics, and the use of inactive drugs as empirical therapy may contribute to the poor outcome in many infections (2,3).

With this case report, we want to emphasize the importance of taking microbiological culture from suspected infection areas because of microorganisms such as *C. indologenes*, although rarely pathogen, may lead to peritonitis.

CASE REPORT

A 68-year-old male with a past history of CAPD treatment for chronic renal failure, presented to our emergency department with complains of nausea-vomiting, fever, abdominal pain and blurred peritoneal fluid for 3 days. Physical examination revealed moderate general condition with confusion, tachycardia (110 bpm), fever (101°F), hypotension (80/50 mmHg), his peripheral capillary oxygen saturations were 80% on room air and had a tender abdomen with redness and warmth around the exit site of the peritoneal dialysis (PD) catheter. He was admitted to the intensive care unit. In his laboratory examinations, leukocyte count was 28300/ μ l (87% neutrophils), C-reactive protein was 26.1 mg/dl (0-0.5), erythrocyte sedimentation rate was 87 mm/hr, hemoglobin was 10.3 mg/dL, albumin was 2.3 gr/dL (3.5-5). Laboratory analysis of PD fluid found that 7800x10⁶/L white blood cells (89% polymorphonuclear leukocytes), which increased to 36200 (95% polymorphs) the following day. Peritoneal fluid and peripheral blood cultures were taken. Gram stain of the peritoneal fluid revealed Gram negative bacilli. Vancomycin 1 g/day/72 hours plus cefepime 1 g/day were intravenously (IV) and intraperitoneal (IP) gentamicin plus vancomycin were administered empirically. Abdominal ultrasonography and abdominal tomography performed, and there was no evidence of perforation or abscess or tunnel infection.

On the third day of administration, it was reported that *C. indologenes* was identified from the periton fluid culture by using API NH system (bioMerieux, NC, USA). There was no growth in blood cultures. Antimicrobial susceptibility testing showed that it had resistant to ampicillin-sulbactam, piperacilin-tazobactam, ceftriaxone, ceftazidime, cefazolin, carbapenems and gentamicin. It was susceptible to ciprofloxacin. Empirical antibiotic treatment was stopped after cultures resulted and IP ciprofloxacin treatment with the dose of 50 mg/L plus 1x400 mg/24h IV was started as recommended (4).

He was discharged from ICU on the 7 days after admission and 24 days after hospital admission, with recovery. The patient responded well to IV plus IP antibiotic therapy. There was no need to remove the PD catheter. In the follow-up, no recurrence of peritonitis was detected after 6 months of treatment. Informed consent was obtained from the patient.

DISCUSSION

CAPD is one of the modern methods used in the treatment of end-stage renal disease. However, peritonitis still remains the most serious complication in these patients. Peritonitis may develop in patients receiving CAPD, depending on many factors, such as sociodemographic, climatic, type of PD and seconder to peritoneal catheter exit site infection or catheter tunnel infection (5). In CAPD patients, peritonitis is usually caused by skin flora bacteria. As a causative pathogen Gram negative bacteria are rare than Gram positives. Gram negative peritonitis may develop secondary to diverticulitis, constipation, environmental contamination and transmural migration (4). *Chryseobacterium* species are, Gram negative organisms and rare cause of human disease. Despite their low virulence they can cause a variety of infections, such as surgical infections, wound infections, ocular infections, urinary tract infections, peritonitis, ventilator-associated pneumonia, indwelling device-associated infection, lumboperitoneal shunt infection, central nervous system infection and biliary tract infections. Most *Chryseobacterium* cases have been health care associated infections, and the thumping majority of cases had underlying conditions (such as neoplasms, stem cell or solid-organ transplant, diabetes mellitus, immunosuppression or prolonged use of broad-spectrum antibiotics) and had undergone invasive procedures (2,3). In our case, the source of peritoneal infection was the exit site of PD catheter. The case had a tender abdomen with redness and warmth around the exit site of the PD. But, there was no evidence of infection in the tunnel or there was no intra-abdominal abscess. There was no growth in blood cultures. No signs and symptoms of the patient's upper respiratory tract, lung, or genitourinary tract infection were observed. Chest radiograph findings evaluated as normal. It has been suggested that the source of infection may be colonization of the peritoneal catheter or contamination.

Most of *Chryseobacterium* infection cases have been reported from Taiwan and rarely from Australia, Europe, India, and the United States (2,3). There are some *Chryseobacterium* infection case reports from Turkey, too (6,7). CAPD-associated peritonitis caused by *C. indologenes* has been reported rarely in the literature till date (8-12). And this is the first case *C. indologenes* peritonitis reported in Turkey according to the source screening.

Chryseobacterium species produce β -lactamases and are naturally resistant to most β -lactam drugs, including carbapenems and aztreonam. Cefepime has modest activity against *C. indologenes*. Fluoroquinolones are usually active in vitro, and sparfloxacin, clinafloxacin, and levofloxacin are somewhat more active than ciprofloxacin. Doxycycline and trimethoprim-sulfamethoxazole susceptibility was variable. Rifampin is active against most strains and has been used as part of combination therapy to clear persistent infection (2). In our case, antimicrobial susceptibility testing showed that *C. indologenes* had resistant to ampicillin-sulbactam, piperacilin-tazobactam, ceftriaxone, ceftazidime, cefazolin, carbapenems and gentamicin. It was susceptible to ciprofloxacin.

The mortality rate of *Chryseobacterium* infections are high as they are resistant to most antibiotics, and as they are rare pathogens isolated from clinical specimens their antimicrobial susceptibility pattern is not well defined (2,3). Peritonitis in PD patients, peritoneal catheter loss and mortality/morbidity increase (1). As the data limited, there is no standard and effective treatment for *C. indologenes* infections. Our case was peritonitis in CAPD patient treated with ciprofloxacin monotherapy.

CONCLUSION

As a result, *C. indologenes* is an extremely rare cause of peritonitis associated with CAPD. These microorganism-induced peritonitis treated successfully with IP antibiotics without need for withdrawal of the peritoneal catheter.

REFERENCES

1. Laxton MK. Peritoneal dialysis: an effective yet underused renal replacement therapy. *JAAPA*. 2016;29(5):40-6.
2. Steinberg JP, Burd EM. Other gram-negative and gram-variable bacilli. In: Mandell GL, Bennett JE, Dolin R, editors. *Mandell, Douglas, and Bennett's Principles and Practice of Infectious Diseases*. 7th ed. Philadelphia, PA: Elsevier Saunders; 2010. p.3022-3.
3. Hsueh PR, Teng LJ, Yang PC, Ho SW, Hsieh WC, Luh KT. Increasing incidence of nosocomial *Chryseobacterium indologenes* infections in Taiwan. *Eur J Clin Microbiol Infect Dis*. 1997;16(8):568-74.
4. Li PK, Szeto CC, Piraino B, de Arteaga J, Fan S, Figueiredo AE, et al. ISPD Peritonitis recommendations: 2016 update on prevention and treatment. *Perit Dial Int*. 2016;36(5):481-508.
5. Liakopoulos V, Nikitidou O, Kalathas T, Roumeliotis S, Salmas M, Eleftheriadis T. Peritoneal dialysis-related infections recommendations: International Society of Peritoneal Dialysis (ISPD) 2016 update. What is new? *Int Urol Nephrol*. 2017;49(12):2177-84.
6. Mirza HC, Tuncer Ö, Ölmez S, Şener B, Tuğcu GD, Özçelik U, et al. Clinical strains of *Chryseobacterium* and *Elizabethkingia* spp. isolated from pediatric patients in a university hospital: performance of MALDI-TOF MS-based identification, antimicrobial susceptibilities, and baseline patient characteristics. *Microb Drug Resist*. 2018;24(6):816-21.
7. Aykac K, Ozsurekci Y, Tuncer O, Sancak B, Cengiz AB, Kara A, et al. Six cases during 2012-2015 and literature review of *Chryseobacterium indologenes* infections in pediatric patients. *Can J Microbiol*. 2016;62(10):812-9.
8. Choi MW, Oh SS, Choi MR, Lee JH, Yang HJ, Sun IO, et al. Peritoneal dialysis-associated peritonitis caused by *Chryseobacterium indologenes*. *Korean J Med*. 2018;93(1):65-7.
9. Afshar M, Nobakht E, Lew SQ. *Chryseobacterium indologenes* peritonitis in peritoneal dialysis. *BMJ Case Rep*. 2013;2013:bcr2013009410.
10. Yoon JS, Hwang EA, Chang MH, Park WY, Jin KB, Han SY, et al. Peritonitis by *Chryseobacterium indologenes* and *Sphingomonas paucimobilis* in a patient undergoing continuous ambulatory peritoneal dialysis (CAPD). *Korean J Nephrol*. 2007;26(6):801-5.
11. Carvalho TJ, Branco PQ, Martins AR, Gaspar A. *Chryseobacterium indologenes* peritonitis in a peritoneal dialysis patient. *BMJ Case Rep*. 2018;11(1):e227713.
12. Cheng WL, Chen K, Hung YC. *Chryseobacterium indologenes* peritonitis in peritoneal dialysis: a rare and difficult case. *Acta Nephrologica*. 2018;32(2):89-92.