Fungal Peritonitis in Patients Undergoing Continuous Ambulatory Peritoneal Dialysis: A Report of Three Cases

SÜREKLİ AYAKTAN PERİTON DİYALİZİ HASTALARINDA FUNGAL PERİTONİT: ÜÇ VAKA ANALİZİ

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Abstract

Fungal peritonitis is a serious complication for patients undergoing continuous ambulatory peritoneal dialysis (CAPD). This retrospective study evaluates the clinical findings and treatment of three patients with chronic renal failure undergoing CAPD and had fungal peritonitis episodes at least once. In all cases the agents, responsible for the peritonitis, were non-albicans *Candida* species; all three had history of bacterial peritonitis and were under antibiotic therapy; all of them also had co-morbid diseases like diabetes mellitus and congestive hearth failure. Other common findings were hipoalbuminemia and anemia. They responded well to intraperitoneal fluconazole therapy. In two patients, remaining catheter in situ caused recurrence of fungal peritonitis..

Key Words: Peritoneal dialysis, fungal peritonitis, candida

Özet

Fungal peritonit (FP), sürekli ayaktan periton diyalizi (SAPD) programında olan kronik böbrek yetmezlikli hastalarda nadir görülen, ancak fatal sonuçlanabilecek bir komplikasyondur. Biz bu çalışmamızda kliniğimizde izlediğimiz üç fungal peritonit vakasını ele aldık. Her üç olguda da etken non-albicans candida idi; bakteriyel peritonit nedeni ile antibiyotik tedavisi altında iken FP gelişmişti; bir önceki peritonit etkenleri gram negatif bakterilerdi; diabetes mellitus, konjestif kalp yetmezliği gibi eşlik eden dahili problemleri vardı. Hastalarda saptanan bir diğer ortak nokta hipoalbuminemi ve anemilerinin olması idi. Flukonazol ile yapılan intraperitoneal tedaviye yanıt alındı. Ancak periton diyaliz katateri çekilmediği takdirde fungal peritonitin tekrarladığı saptandı.

Anahtar Kelimeler: Periton diyalizi, fungal peritonit, kandida

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Peritonitis is a serious complication for patients undergoing continuous ambulatory peritoneal dialysis (CAPD) and it is associated with important morbidity and even mortality. Fungi species are responsible for 1-15% of all episodes of peritonitis.[1-4] Although fungal peritonitis is uncommon, it can be life-threating and usually requires immediate catheter removal and modifying modality to hemodialysis.

This retrospective study evaluates the clinical findings, treatment and follows up of three patients with chronic renal failure (CRF) undergoing CAPD and had fungal peritonitis episode at least once. All of the patients were admitted to hospital, Ankara Training and Research Hospital, in 2004 and monitorised in our ward, Clinical Microbiology and Infectious Diseases Department.

Case I

A 50-year-old male patient with three years diagnoses of CRF and undergoing CAPD for the last one year, presented with abdominal pain, nausea and cloudy peritoneal effluent. He had been on follow up for diabetes mellitus for ten years. There was no fever on his pyhsical examination, vital signs were normal, but he had abdominal tenderness. Laboratory findings were as follows: Hb: 7,8

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g/dL, Htc: 22%, WBC: 12.200/mm^3, ESR: 140 mm/h, Ca: 8,1 mg/dL, P: 5,9 mg/dL, urea: 98 IU/L, creatinin: 6,7 mg/dL, total protein: 5,8 g/dL, albumin: 2,8 g/dL. Other biochemical findings were within normal ranges. The effluent WBC count was 33,440/mm^3 with 95% polymorphonuclear leukocytes (PMNL). *Enterobacter cloacea* and *Klebsiella pneumoniae* were identified from effluent culture and gentamicin 20 mg qid intraperitoneal (IP) therapy was commenced. On the fourth day of therapy, a control culture was performed for the persistant sypmtoms and non-albicans *candida* (NAC) was identified from the effluent. Therefore fluconazole 50 mg qid IP was added to present therapy. Gentamicin therapy was completed to 21 and fluconazole therapy to 14 days and the patient was discharged. Because the patient responded to therapy, the peritoneal dialysis (PD) catheter was not removed. However, the patient presented again with the same complaints one month later. *Klebsiella pneumoniae* was identified from the effluent culture and gentamicin 20 mg qid IP was administered. On the fifth day of therapy, NAC was identified again from the control effluent culture and the same dose as before was administered. In his this episode the patient had tunnel infection while he was under therapy. So the PD catheter had to be removed. The patient got well and was discharged after 14 days of therapy.

Case II

A 75-year-old female patient with CFR undergoing CAPD admitted with the complaints of fatique, abdominal discomfort and cloudiness of the effluent. She was under CAPD for four months. She also had type 2 diabetes mellitus, coronary artery disease and hypertension. Generalised abdominal tenderness, positive rebound and pretibial edema were remarkable on her physical examination. Pertinent laboratory findings were Hb: 8.5 g/dL, Htc: 80.4%, WBC: 21.800/mm^3, ESR: 124 mm/h, urea: 88 mg/dL, creatinin: 4.4 mg/dL, total protein: 4.6 g/dL, albumin: 1.7 g/dL. The effluent WBC count was 2800/mm^3 with 95% PMNLs. Cefazolin 250 mg qid IP and gentamicin 16 mg qid IP were administered. *Escherichia coli* was identified from the effluent culture. Candida eusophagitis was found at the endoscopy which was performed for the hematemesis. On the fifth day of therapy, NAC was identified from the effluent culture. She had acute myocardial infarction at the same day and died before the initiation of antifungal therapy.

Case III

A 55-year-old male patient who had diagnosis of CRF for two years and undergoing CAPD for six months, presented to our outpatient clinic with abdominal pain and cloudy PD effluent. He had previous history of coronary heart disease, congestive heart failure, chronic obstructive pulmonary disease, chronic venous insufficiency and an inappropriate warfarin usage history. He had experienced two gram negative peritonitis episodes in last six months while he was under CAPD. Physical examination revealed diffuse abdominal tenderness and a positive rebound. In addition, the PD catheter entry site was found edematous and hyperemic. Essential laboratory findings were Hb: 9.7 g/dL, Htc: 31%, WBC: 11.900/mm^3, urea: 128 mg/dL, creatinin: 8.1 mg/dL, total protein: 6.8 g/dL, albumin: 2.7 g/dL, aPTT: 85 seconds and PT: 37.5 seconds. Other biochemical findings were within normal limits. The PD effluent was bloody and microscopic examination disclosed 870/mm^3 WBCs (90% PMNL) and 2000/mm^3 red blood cells. After collection of blood and PD effluent cultures, cefazoline 250 mg qid IP and gentamicin 16 mg qid IP therapy was initiated. NAC was identified from the PD effluent culture and the therapy was modified to fluconazole 50 mg qid IP. While he was on the antifungal therapy, a dental abcess was found and ampicillin-sulbactam 2 gr qd IV added to his therapy. Three days after the startment of fluconazole, the WBC count of the effluent decreased to 230/mm^3. However, on fifth day of flucanazole therapy an increase in the WBC count of the effluent was noted and NAC was identified again from the PD effluent culture. Therefore CAPD catheter had to be removed. His renal re-

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placement therapy was modified to hemodialysis. With 14 days of fluconazole therapy his peritonitis was cured and he had been discharged. He had died three weeks after his discharge due to an acute myocardial infarction.

Discussion

Fungal peritonitis is a rare but serious complication of CAPD, which may lead to fatality. Observational studies suggest that fungal peritonitis (FP) accounts for approximately 3% of all peritonitis episodes.[5] The mortality rate varies from 5% to 53%, while drop-out from CAPD occurs in up to 40% of the patients[1] and usually requires replacement of CAPD with hemodialysis. *Candida* species were the most common causative agents for the FP, accounting for 89.3% of episodes as sole pathogen. Among *candida* species, NAC is at 53.6% were more common than *Candida albicans*, at 35.7%.

There are no exact predisposing factors determined for FP in patients undergoing CAPD. However, recently it was reported in the literature that 61-95% of FP patients had received broad-spectrum antibiotics within the preceding month.[1-4] Prasad et al. reported in their study that FP was more frequent in patients who had bacterial peritonitis before, than the others and mortality rate was higher in patients with abdominal pain, fever and remaining catheter in-situ.[6] Kaitwatcharachai reported in his study that FP is especially seen after Gram negative peritonitis episodes.[7]

In our study, all of our patients had a history of bacterial peritonitis and FP episodes were developed while they were under antibiotic therapy. Also all bacterial pathogens responsible for the peritonitis were Gram negatives.

The treatment of FP is difficult because the fungi form a biofilm on the surface of the silastic catheters that reduces the penetration of antifungal agents. Wang et al. divided the factors, which leads to failure in therapy of FP patients into factors predicting technique failure and mortality factors. They defined the mortality factors as presence of abdominal pain, bowel obstruction and histroy of antibiotic use within preceding 3 months. In addition to these remaining, catheter in-situ is associated with technical failure.[8] Most agree that early catheter removal is essential for successful eradication of FP and some have argued that it may be the only therapy needed. Because of that, catheter removal as well as antifungal therapy is essential if cure is to be achived in most cases.

Amphotericin B (IP or IV), fluconazole (peroral or IP), itraconazole, voricanozole, ketoconazole, 5- flucytozine were used alone or in combination therapy as antifungal drugs.[1-4,7-10] For our patients, fluconazole 200 mg daily IP, was administered. One of the patients died the day she had been diagnosed as FP; one of them responded the antifungal therapy but died later because of cardiac problems. Older age, history of recurrent peritonitis episodes, diabetes mellitus, anemia and hipoalbuminemia were the patients' comorbid findings. In two patients, catheter had to be removed as well as the antifungal therapy.

In conclusion, these three cases highlight a rare but potentially life threatening complication of CAPD. If there is recurrent peritonitis episodes and a poor response to antibacterial therapy fungal peritonitis should be suspected. For the successful management of fungal peritonitis beside the antifungal therapy, catheter removal is recommended.

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