ORIGINAL RESEARCH PAPER
Volume - 9 | Issue - 11 | November - 2020 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

9 CASES OF FUNGAL PERITONITIS COMPLICATING PERITONEAL DIALYSIS IN THE REGION OF WESTERN PART OF INDIA

Zoology

Akanksha Shukla PHD Student, Department Of Zoology, Himalayan University Arunachal Pradesh, India.

Ashutosh Soni* Associate Professor & HOD, Department Of Nephrology, Pacific Medical College & Hospital, Udaipur, Rajasthan, India. *Corresponding Author

ABSTRACT

Introduction: In recent years, the frequency of bacterial peritonitis in patients with end-stage renal disease treated by peritoneal dialysis (PD) has been reduced because of improvements in dialysis equipment and a better approach to treatment. Nevertheless, fungal peritonitis (FP) remains a serious complication associated with high rates of morbidity and mortality. The reported incidence of FP is 2%–10.2%, the mortality rate is 5%–25%, and 40% of patients with an episode of FP are switched to hemodialysis. The most common cause of FP is *Candida* species, with *Candida albicans* predominating.

The incidence of fungal peritonitis (FP) and the fungi that caused FP were evaluated during 1-year period from Oct-2019 to Oct-2020 at Pacific Medical College & Hospital, Udaipur, Rajasthan. 71 episodes of peritonitis occurred, 9 (12.6%) of which were caused by fungi. Early diagnosis of FP and prompt therapy decreases morbidity and mortality. Here we describe the clinical features, predisposing factors, and outcomes of these nine cases.

Case series: Clinical presentation of fungal peritonitis did not differ from other cases of peritonitis. Among the nine cases that were diagnosed in our center, seven cases were due to Candida species and two were due to Aspergillus. All patients had received antibiotic therapy within one month of diagnosing fungal peritonitis; eight of them had received intraperitoneal (IP) antibiotics for a previous episode of bacterial peritonitis and one patients had received a course of oral antibiotics for exit site infection. three of the patients were diabetic. The treatment of FP included administration of amphotericin B (20–25 mg iv q.d.) and 5-fluorocytosine (50 mg in every 2-L PD bag) for 14 days, followed by administration of fluconazole (100 mg po q.d.) for 1 month, and all had their dialysis catheter removed. One patient died, and the others were transferred permanently to hemodialysis (HD). Two patients developed encysted intra-abdominal fluid collections 15 and 48 days after catheter removal.

Conclusion: FP is a serious complication of PD leading to loss of ultrafiltration and discontinuation of PD treatment. The prompt diagnosis of FP and the early institution of therapy decrease the rates of morbidity and mortality.

KEYWORDS

fungal peritonitis, peritoneal dialysis, end stage renal disease (ESRD)

INTRODUCTION:

Fugal peritonitis complicating CAPD is not uncommon in our center. Since continuous ambulatory peritoneal dialysis (CAPD) was introduced as a treatment modality for patients with end stage renal disease (ESRD), peritonitis has been one of the most important complications that can lead to technique failure. Fungal peritonitis is a rare but serious complication of CAPD, being responsible for 2.6-14.3% of all peritonitis episodes occurring in this set of patients [1-9]. Given the high complication rate that may result in mortality and technique failure, fungal peritonitis is considered to have a particularly poor prognosis [8-10].

The diagnosis of peritonitis was based on clinical manifestations (abdominal pain, nausea, and fever) and a cloudy appearance of the dialysis effluent (DE), with a WBC count of >100 cells/mm3 (with neutrophil predominance). Diagnosis was confirmed by the isolation of the same fungus from >1 DE sample. Candida species constitute the most common isolate, accounting for 70-89% of cases [5-8]. For the identification of *C. albicans,* a screening test of the germination tube was initially performed. If the result was negative (for *C. albicans*), the Api-System CAUX20 or Api-System ID 32C (bioMe´rieux) was used. Susceptibility testing of all isolated *Candida* species to the antifungal drugs 5-fluorocytosine, amphotericin B, nystatin, miconazole, econazole, and ketoconazole was performed first by the method of Drouhet and Dupont [11] and second by determination of the MIC with use of the commercially available ATB-fungus test (bioMe´rieux).

Predisposition to fungal infections is multi-factorial; possible predisposing factors include diabetes mellitus, use of immunosuppressive drugs, a break in sterile technique and extensive use of antibiotics for bacterial peritonitis.

During the 12 months of this center activity, 9 of 71 peritonitis episodes were fungal in origin (12.6%). This is a rather high percentage compared to that reported from other centers in recent years [6-9]. The aim of this study is to evaluate the clinical features, predisposing factors, and outcomes of those episodes.

CASE SERIES:

Between Oct-2019 and Oct-2020 85 patients with ESRD underwent regular PD at Pacific Medical College & Hospital, Udaipur, Rajasthan.; all of them were on CAPD. Peritoneal dialysis access was achieved with a Tenckhoff catheter; most catheters were inserted by open surgical dissection and a few were inserted by means of the modified Seldinger technique.

During this period, 71 episodes of peritonitis were recorded; 9 of them were fungal in origin (12.6%). The nine episodes occurred in 9 different patients; 6 males and 3 females, with a mean age of 57.2 years (range 42 – 67 years). Three of them were diabetic. All patients had received antibiotics within one month of fungal peritonitis: 8 patients had received intraperitoneal (IP) antibiotics for bacterial peritonitis and 1 patient had received oral antibiotics for exit site infection.

All patients presented with abdominal pain and cloudy effluent, 5 of them had fever, 2 had diarrhea and 1 had vomiting. The dialysate white cell count varied between 200-1905/mm3, with neutrophil predominance in all cases.

Gram stain of the deposit yielded the diagnosis in the majority of cases. Culture was performed from the dialysate deposit on solid culture media (MacConkey, blood agar and chocolate agar) incubated for 72 hours at 37°C. The interval between presentation and diagnosis of fungal peritonitis varied between 2 – 24 days; 7 cases were due to Candida species and 2 cases were due to Aspergillus; further identification of Candida subtypes was not feasible.

The treatment of FP included administration of amphotericin B (20–25 mg iv q.d.) and 5-fluorocytosine (50 mg in every 2-L PD bag) for 14 days, followed by administration of fluconazole (100 mg po q.d.) for 1 month. If there was no clinical improvement, the PD catheter was removed on the fifth to seventh day of treatment, intraperitoneal administration of 5- fluorocytosine was stopped, and the patient was treated by hemodialysis for 4–6 weeks. After this period, a new catheter was inserted in patients who recommenced PD treatment.

The mean interval between the diagnosis of fungal peritonitis and catheter removal was 2.5 days (range 1-6 days).

One of the three diabetic patients died from sepsis three days after catheter removal; in her case the catheter had been removed within 24 hours from diagnosis.

The other 2 diabetic patients also had his catheter removed within 24 hours of diagnosis and were shifted to HD. They showed prompt clinical improvement but they presented again after two weeks with an abscess in the old tunnel tract that required surgical drainage, and an encysted fluid collection in the anterior abdominal wall that was aspirated under ultra-sound guidance. The encysted fluid did not re-accumulate and the patient has been doing well on HD since then.

Another patients (fourth & fifth) had her catheter removed four days after the diagnosis of fungal peritonitis and were shifted to HD. they showed good initial response to treatment but presented again after 48 days with an encysted intra-abdominal fluid collection that was aspirated under ultra-sound guidance.

The sixth patient with Candida peritonitis had concomitant Staphylococcus epidermidis peritonitis which was sensitive to cefazolin. He responded well to a combination of antifungal and antibacterial treatment with no complications, and was shifted permanently to HD.

The another three patients (7^{th}, 8^{th},& 9th) patients responded well to treatment and had no immediate or long term complications in spite of the catheter being removed after 6 days of the diagnosis in one of them; all three were transferred permanently to HD.

DISCUSSION:

FP is a serious complication of treatment with PD, with high rates of morbidity and mortality. In patients undergoing PD, many factors are present that are liable to favor the occurrence of FP, including rupture of the cutaneous barrier, as a result of the presence of the catheter, and reduced cellular immunity during chronic end-stage renal disease.

The proportion of CAPD related peritonitis due to fungi is currently 12.6 % in our center, which is comparable to that reported in the literature (2.6 – 14.3%) [1-9]; however, the proportions reported from most centers in more recent years are lower than ours [6-9]. The causative organism was Candida species in 7 out of 9 patients (77.7%), in agreement with data from the literature (70 – 89.3%) [1-9].

All our patients had received antibiotics within one month of fungal peritonitis; 8 received intraperitoneal antibiotics for bacterial peritonitis and 1 received systemic antibiotics for exit site infection. Susceptibility testing revealed that amphotericin B was the only antifungal agent to which all recovered organisms were susceptible.

Another predisposing factor was diabetes mellitus in three of the patients. Intraperitoneal or systemic antibiotics were hence the major predisposing factor for fungal peritonitis in our patients.

Several suggestions proposing to reduce the incidence of fungal peritonitis were raised. Avramovic et al attributed their low incidence of fungal peritonitis (2.6%) to the in-hospital treatment of bacterial peritonitis episodes [12]. Prophylactic use of oral nystatin or fluconazole during antibiotic therapy has also been suggested to play a role in preventing fungal peritonitis [13].

Brian et al [14] suggested that removal of the dialysis catheter and treatment with fluconazole may provoke the formation of massive peritoneal adhesions and recurrent peritoneal abscesses, as has happened to two of our patients. They believe that temporary discontinuation of peritoneal dialysis is neither essential nor desirable in the management of fungal peritonitis, and they suggest that peritoneal lavage with a temporary catheter and administration of intraperitoneal and oral antifungal agents offer an effective alternative regimen for the management of fungal peritonitis in CAPD patients. This approach needs further study.

CONCLUSION:

FP is a serious complication of PD leading to loss of ultrafiltration and discontinuation of PD treatment. The most frequently isolated fungi are C. albicans. Treatment requires administration of antifungal agents, especially amphotericin B, to which organisms are still susceptible, and early removal of the peritoneal catheter. The prompt diagnosis of FP and the early institution of therapy decrease the rates of morbidity and mortality.

Acknowledgments: We thank the Department of Medical Microbiology, **Pacific Medical College** Udaipur, Rajasthan, India, for technical support regarding the susceptibility testing for Clinical Laboratory Standards method.

Conflict of interest: There is no conflict of interest between authors.

REFERENCE:

1. Goldie SJ, Kiernan-Tridle L, Torres C, Gorban-Brennan N, Dunne D, Kliger AS, Finkelstein FO. Fungal peritonitis in a large chronic peritoneal dialysis population: a report of 55 episodes. Am J Kidney Dis. 1996;28:86-91.
2. Chan TM, Chan CY, Cheng SW, Lo WK, Lo CY, Cheng IK. Treatment of fungal peritonitis complicating continuous ambulatory peritoneal dialysis with oral fluconazole: a series of 21 patients. Nephrol Dial Transplant. 1994;9:539-42.
3. Zelenitsky S, Barns L, Findlay I, Alfa M, Ariano R, Fine A, Harding G. Analysis of microbiological trends in peritoneal dialysis-related peritonitis from 1991 to 1998. Am J Kidney Dis. 2000;36:1009-13.
4. Prasad KN, Prasad N, Gupta A, Sharma RK, Verma AK, Ayyagari A. Fungal peritonitis in patients on continuous ambulatory peritoneal dialysis: a single Indian center experience. J Infect. 2004;48:96-101.
5. Manzano-Gayosso P, Hernández-Hernández F, Méndez-Tovar LJ, González-Monroy J, López-Martínez R. Fungal peritonitis in 15 patients on continuous ambulatory peritoneal dialysis (CAPD). Mycoses. 2003;46(9-10):425-9.
6. Das R, Vaux E, Barker L, Naik R. Fungal peritonitis complicating peritoneal dialysis: report of 18 cases and analysis of outcomes. Adv Perit Dial. 2006;22:55-9
7. Rosa NG, Silva S, Lopes JA, Branco P, de Almeida E, Ribeiro C, Abreu F, Barbas J and Prata MM. Fungal peritonitis in peritoneal dialysis patients: is previous antibiotic therapy an essential condition? Mycoses. 2006;50:79-81.
8. Bibashi E, Memmos D, Kokolina E, Tsakiris D, Sofianou D and Papadimitriou M. Fungal peritonitis complicating peritoneal dialysis during an 11-year period: report of 46 cases. CID. 2003;36:927-31.
9. Lo SH, Chan CK, Shum HP, Chow VC, Mo KL, Wong KS. Risk factors for poor outcome of fungal peritonitis in Chinese patients on continuous ambulatory peritoneal dialysis. Perit Dial Int. 2003;23 Suppl 2:S123-6.
10. Wong P, Mak S, Lo K, Tong GMW and Wong AKM. A retrospective study of seven cases of Candida parapsilosis peritonitis in CAPD patient: the therapeutic implication. Perit Dial Int. 2000;20:76-9.
11. Drouhet E, Dupont B, Improvisi L, Vivani MA, Tortorano AM. Disc agar diffusion and microplate automated techniques for in vitro evaluation of antifungal agents on yeasts and sporulated pathogenic fungi. In: Iwata K, Vanden Bossche H, eds. In vitro evaluation of antifungal agents. Amsterdam: Elsevier, **1986**:31–48.
12. Avramovi M, Radovanovi-Velikovi R, Djordjevi V, Miti B, Kosti S. Fungal peritonitis in contiuous ambulatory peritoneal dialysis. Medicine and Biology. 1997;4(1):62-5.
13. Abraham G, Thiagarajan T, Mathew M. Prevention of peritoneal dialysis related infections as a means to prevent dropout. Indian J Nephrol. 2005;15(2):S10-S13.
14. Keogh JAB, Carr ME, Murray F, McEvoy M, Grant G and Keane CT. Treatment of fungal peritonitis in CAPD patients using peritoneal lavage. Perit dial Int. 1985;5(1):67-9.