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Tuberculous Peritonitis in a Patient Undergoing Continuous Ambulatory Peritoneal Dialysis

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ABSTRACT

Complication of peritonitis developed in a 61 year old patient who was undergoing continuous ambulatory peritoneal dialysis (CAPD) and whose dialysate culture was negative for both aerobic and anaerobic bacteria and fungi. Despite the administration of various antibiotics and repeated mechanical lavages, inflammatory response and fever could not be controlled and therefore on the 8th hospital day the catheter was removed and hemodialysis was commenced. On about the 40th day thereafter, culture test of CAPD dialysate demonstrated mycobacterium tuberculosis and thus anti-tuberculous therapy was commenced, which led to a favorable course.

It is considered that tuberculosis should be suspected in CAPD patients complicated with peritonitis whose dialysate culture is negative for both aerobic and anaerobic bacteria and fungi.

Key words: *Tuberculous peritonitis, Continuous ambulatory peritoneal dialysis, Mycobacterium tuberculosis*

Continuous ambulatory peritoneal dialysis (CAPD) is an artificial kidney developed by Popovich and Moncrief[16] in 1975 and is at present widely employed in various countries of the world. However, such complications as peritonitis, umbilical hernia, abnormal position and occlusion of the catheter, and hypokalemia have been reported[15]. In particular, peritonitis is one of the important complications caused by *Staphylococcus epidermidis, Staphylococcus aureus, Streptococcus, E. coli,* and *Klebsiella*[3,5,12,17]. In addition, such fungi as Candida and Aspergillus have also been reported[9], but mycobacterium tuberculosis has rarely been responsible. We recently observed a case in whom CAPD had to be abandoned due to tuberculous peritonitis.

CASE REPORT

CAPD therapy was initiated on 5 February 1987 on a 61 year old female with chronic renal failure due to chronic glomerulonephritis, but due to clouding of CAPD dialysate observed on 16 June of the same year, the patient was admitted to this department under the diagnosis of peritonitis. She had undergone surgery for retroflexio uteri 35 years ago, but had no past history of tuberculosis.

At time of admission, body temperature was 37.5°C and blood pressure was 130/80 mmHg and within the normal range. Slight edema was observed on the face and the palpebral conjunctiva was anemic. No abnormality could be observed in the heart and lung. Though an operative scar was observed in the abdominal region, the liver, spleen, and kidney were not palpable. Edema was observed in the lower extremities.

WBC of the peripheral blood was 9,800/mm^3 with left nuclear shift. RBC was 295 × 10^4/mm^3, hemoglobin 8.0 g/dl, and hematocrit 24.6%. Blood sedimentation rate was accelerated to 140 mm/hr and CRP showed a high value of 8.7 mg/dl. Though serum albumin presented a low value of 2.6 g/dl, no abnormality could be observed in liver function test, lipids, and electrolytes. BUN and serum creatinine were 37.0 mg/dl and 8.91 mg/dl, respectively, and were satisfactorily controlled by CAPD, but β_2-microglobulin showed and abnormally high value of 48,225.6 ng/ml. IgG was 1170 mg/dl, IgA 133 mg/dl, and IgM 56 mg/dl and were practically normal, but in T cell subsets of lymphocytes Leu 3a/Leu 2a was remarkably depressed to 0.84. In addition, chest X-ray and ECG findings were normal. The cell count in the CAPD dialysate was elevated to 400/mm^3, but CAPD dialysate culture was negative for not only aerobic and anaerobic bacteria but also fungi. The direct smear of CAPD dialysate was also negative for mycobacterium tuberculosis. Furthermore, blood culture and urine culture were also negative.

Following admission, Cephem antibiotics such as Cefoperazone and Tobramycin were intraperitoneally administered and mechanical lavages were repeated, but body temperature rose to a maximum of 39.3°C. Furthermore, as accelerated blood sedimentation rate, elevated CRP, and leukocytosis in the peripheral blood and CAPD dialysate could not be controlled by this therapy, systemic administration of other types of antibiotics was

tried but without effect. On the 8th hospital day, the catheter was removed and CAPD therapy was abondoned, and hemodialysis was commenced. Thereafter, systemic antibiotics were given and the body temperature gradually diminished though inflammatory response persisted. Thus the patient was transferred to a hospital associated with this department on I July of the same year for the purpose of maintenance hemodialysis.

The results of culture of CAPD dialysate for mycobacterium tuberculosis conducted on 18 and 19 June became available on 1 August. As the results were positive, commencement of anti-tuberculous therapy with the administration of such specific drugs as Rifampicin, Streptomycin, and Isonicotinic acid hydrazide was carried on from the same day, resulting in disappearance of fever and normalization of WBC and CRP. The present course is favorable. In order to identify the tuberculous foci, whole body computed tomography and sonographic examination were performed, but no evident foci could be detected. Mantoux test had not been conducted at time of admission, but when the diagnosis of tuberculous peritonitis could be confirmed, the test was positive.

DISCUSSION

Among the complications of CAPD, peritonitis is the most important, but the responsible organism is generally aerobic and anaerobic bacteria and is rarely mycobaterium tuberculosis. The first two cases of CAPD being complicated with tuberculous peritonitis were reported by Khanna et al[8] in 1980 and thereafter cases have been reported by Holley et al[7], Kluge[10], and Mckerrow et al[13], but the number of cases reported to date is small.

In reviewing the cases reported to date[2,7,8,10,11,13,14], the clinical characteristics of tuberculous peritonitis in CAPD patients are that dialysate culture is negative for both aerobic and anaerobic bacteria and fungi and that clouding of the dialysate, fever and abdominal pain persist despite the administration of various antibiotics. These characteristics were also evident in the present case. Furthermore, lymphocytosis of the peritoneal fluid frequently observed in tuberculous peritonitis[4,18] other than in CAPD patients is not necessarily regarded to be common.

Demonstration of mycobacterium tuberculosis is made by culture of CAPD dialysate, direct smear, and laparotomy, but in some cases they are demonstrated on autopsy.

In the development of tuberculous peritonitis in CAPD patients, depressed cellular immunity often observed in chronic renal failure patients is regarded to play an important role[1,6]. A remarkable depression of Leu 3a/Leu 2a in T cell subsets of lymphocytes was also observed in the present case. As for the past history of tuberculosis of other organs, in most of the cases including the present case there is no past history of tuberculosis.

In the therapy, the combination of Rifampicin, Streptomycin, and Isonicotinic acid hydrazide was made in the present case, but use of Ethambutol instead of Streptomycin has been reported in the literature because of the presence of renal failure. As for the period of administration, it has been recommended that administration should be continued for a relatively longer period of time[7]. Prognosis is not necessarily good with some reported cases of death.

The foregoing is a report with some discussion of the literature on a case of CAPD patient complicated with tuberculous peritonitis. In the management of CAPD patients complicated with tuberculous peritonitis in whom dialysate culture is negative for not only aerobic and anaerobic bacteria but also fungi, tests and therapy should be made carefully with possibility of tuberculosis in mind.

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