

Continuous Ambulatory Peritoneal Dialysis in a Patient with Isolated Right Heart Failure and Ascites: A Case Report

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Peritoneal dialysis is the ultrafiltration therapy of choice for the long-term ambulatory management of patients with diuretic-resistant refractory congestive heart failure. Here we report a case of patient with right heart failure, massive ascites, and refractory to medical treatment treated with continuous ambulatory peritoneal dialysis.

Key words

Continuous ambulatory peritoneal dialysis, ascites, congestive heart failure

Introduction

Hybrid continuous extracorporeal therapies have increasingly been used for ultrafiltration (UF) in patients with diuretic-resistant congestive heart failure (CHF). However, hemodynamic instability during these procedures, an increasing prevalence of cardiorenal syndrome, and the need for hospitalization are the major challenges in using extracorporeal treatment modalities. No randomized trials have been conducted to compare these modalities with peritoneal dialysis (PD).

Case report

Our patient was an 81-year-old Caucasian woman for whom continuous ambulatory PD (CAPD) was initiated to achieve UF. She had end-stage CHF resulting from valvular heart disease diagnosed in 1998, and she subsequently had aortic valve replacement with tissue prosthesis.

At the time of referral to the chronic kidney disease clinic, the patient weighed 54.4 kg, had significant

pedal edema, massive ascites, and systolic ejection murmur at the apex. She was cognitively intact and needed minimal help at the skilled nursing facility (SNF). She had been resistant to medical treatment for 2 months, with creatinine increasing to 2.3 mg/dL from 1.9 mg/dL (estimated glomerular filtration rate of 17 mL/min). Her urine output was approximately 600 mL daily. An echocardiogram before initiation of extracorporeal UF showed that the patient had severe tricuspid regurgitation, an ejection fraction of 58%, pulmonary artery pressure of 50 mmHg, and a markedly dilated right atrium and ventricle. Her medications included furosemide, spironolactone, aspirin, atorvastatin, and darbepoetin injections.

Because of cardiorenal syndrome and diuretic resistance, this patient was offered slow continuous UF (SCUF). She underwent three sessions of SCUF in the intensive care unit. Using a permacath as vascular access, blood flow of 150 mL/min was obtained, and the patient achieved a mean UF of 6 L per session. However, she did not tolerate the UF, as evidenced by a drop in the blood pressure from 122/88 mmHg to 90–80 mmHg systolic over 70–58 mmHg diastolic, and her creatinine worsened to 3.8 mg/dL.

After insertion of a Tenckhoff peritoneal catheter in this patient, we initiated her onto CAPD with a prescription of 1.5% dextrose for 3 cycles of 8 hours' dwell time daily. All 3 cycles were performed by the nursing staff at the SNF. In the first week after initiation of PD, the patient achieved 1800 mL of UF in 24 hours. By the second week, she achieved 2200 mL of UF in 24 hours. No episodes of hypotension were noted, and creatinine stabilized at 2.3 mg/dL.

During the next 7 months, this woman was not admitted even once, and we were able to restart her furosemide and spironolactone at the recommended

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dosages for CHF. Tremendous improvement in quality of life and marked patient satisfaction were observed after she started on PD.

This woman died of cardiorespiratory arrest at the SNF 7.5 months after starting PD.

Conclusions

Clinical experience with the use of CAPD for UF in patients with right heart failure and ascites is limited (1–3), but the slow, continuous abdominal paracentesis resulting from PD offers added advantages in patients with ascites. It increases preload by reducing the intra-abdominal and intrathoracic pressures; it reduces compression of the right heart chambers, improving renal blood flow; and it reduces afterload by reducing aortic compression.

The beneficial effect of paracentesis has previously been described by improved cardiac performance through the Frank–Starling mechanism, leading to an increase in cardiac output. The reduction in cardiac pressure is more evident for the right ventricle, probably because of the greater compliance of this chamber (4). In patients with ascites, enhanced UF is attainable even with dialysis fluid of lower tonicity. The larger total volume increases the effective peritoneal surface

area, resulting in recruitment of a larger number of capillaries participating in the UF process (1).

We therefore recommend selecting CAPD as the treatment modality of choice for UF in patients with end-stage right heart failure resistant to medical treatment.

References

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