PERITONEAL DIALYSIS IN END-STAGE RENAL DISEASE PATIENTS WITH LIVER CIRRHOSIS AND ASCITES

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Abstract

End-stage renal disease (ESRD) patients with liver cirrhosis (LC) and ascites are in a critical status that is difficult to manage on conventional hemodialysis (HD) or continuous renal replacement therapy (CRRT) because of their hemodynamic instability and risk of bleeding. Peritoneal Dialysis (PD) offers them a viable alternative, along with a stable hemodynamic status, a lower risk of bleeding, a more flexible way of management, and a great reduction of staff as well as cost. Therefore, we collected 3 ESRD with liver cirrhosis and ascites patients to receive PD. The first patient was a 77-year-old man who had ESRD, hepatitis C virus (HCV) related LC and ascites, and congestive heart failure (CHF). He had received 6 months HD and shifted to PD because of shock during HD session and intractable ascites. The second patient was a 53-year-old man who had ESRD due to diabetes mellitus (DM) and hepatitis B virus (HBV) hepatitis with ascites. He chose PD because of advantage of home care. The third patient was a 75-year-old woman who had ESRD due to DM, CHF and HCV hepatitis with ascites. She chose PD because of hemodynamic instability. All of them tolerated PD well. Hemodynamic status was stable during PD even massive ascites (> 5,000 cc/d) was drained at the initial periods. No needs for anticoagulants, continuous solute clearance, caloric loading with glucose from dialysate, and drainage of ascites to maintain better life quality are advantages of PD.

As patients of ESRD with LC and ascites or LC with ascites exacerbated to ESRD are frequently encountered in ICU, PD may be the better way than HD, Continuous Veno-Venous Hemofiltration (CVVH), or Slow Low Efficiency Daily Dialysis (SLEDD) to treat them.

Key Words: End-stage renal disease (ESRD), Peritoneal dialysis (PD), Hemodialysis (HD), Ascites, Liver cirrhosis (LC)

Introduction

Owing to the rapid increasing of ESRD patients in Taiwan, the incidence and prevalence rate are the highest in the world. Many special and critical conditions are encountered in the clinical practice. ESRD with liver cirrhosis and ascites or liver cirrhosis with ascites and ESRD due to
hepatorenal syndrome are of the most difficult challenges. Hemodynamic instability, intractable ascites, urea clearance, and electrolytes imbalance are the major problems. HD and CRRT cannot adequately overcome them.\textsuperscript{1,3} We reported 3 patients with refractory ascites due to liver cirrhosis concomitant ESRD in whom Tenckhoff catheters were inserted with successful relief of ascites and clearance of uremic toxin by PD.

2 of them had been admitted to ICU because of critical conditions and PD still could afford them a best way to pass through the treatment course. Therefore, we suppose it is time to introduce PD instead of HD or CRRT for these groups of patients in the ICU.

**Case Presentation**

The first patient was a 53 year-old man who had ESRD due to DM nephropathy, hypertension, and HBV hepatitis with cirrhosis and ascites. He received Tenckhoff catheter implantation on Sep. 15, 2008 and massive ascites (5,500 cc) was drained without hemodynamic change during the operation. CAPD therapy was performed since Oct. 01, 2008 and the initial ultrafiltration volume was about 10,000 cc/d, which gradually reached to the adequate amount of 1000 c.c./d till Mar. 4, 2009. Serum albumin was 2.6 g/dl before and 2.4 g/dl 6 months after initiating dialysis. PET showed D/P Creatinine was high (0.86). Total Kt/V was 3.81. Except two episodes of right side hydrothorax with good response to pleurodesis, the patient was subjectively well, had good appetite, adequate performance, and did not complain of abdominal distension. Unfortunately, he experienced sudden death on the way to clinic on Jan. 01, 2010.

The second patient was a 77-year-old man with a history of ESRD due to gouty nephropathy, CHF, and HCV hepatitis with massive ascites. He started HD via AVG since Jun. 08, 2009. Intractable ascites and intra-dialysis hypotension were progressive. He, then, received Tenckhoff catheter insertion on Dec. 25, 2009 and massive ascites (5,075 cc) was drained without hemodynamic change during the operation. CAPD was started since Jan. 6, 2010 and the UF volume was about 800-1,000 cc/d. Serum albumin was 2.3 g/dl before and 2.6 g/dl after 2 months’ CAPD. PET showed D/P Creatinine was high (0.87). Total Kt/V was 0.86. He had one episode of peritonitis because of inadequate CAPD operation skill. The peritonitis was soon under control by IP antibiotics treatment. He had experienced a period of well being with good appetite, good spirits, and abdominal relaxation. On Feb. 16, 2010, He was admitted to ICU because of esophageal candidiasis and shock due to hypovolemia and sepsis. His condition was soon under control by antibiotics, nutrition enhancement, and adequate CAPD therapy. Unfortunately, acute onset of tonic-clonic seizure and coma occurred after transferring to ordinary ward. No definite CNS lesion or metabolic problem was confirmed. He died on Mar. 10, 2010 by conservative treatment requested by his family.

The third patient was a 76-year-old woman with a history of ESRD due to DM nephropathy, CHF, and HCV hepatitis with massive ascites. She received Tenckhoff catheter implantation on Dec. 31, 2009 and the ascites drainage was 3500cc during the procedure. She started CAPD with 1.5% 1.5 L dialysate t.i.d. since Jan. 01, 2010 and UF volume was 1,000-1,200 c.c./d. Serum albumin was 2.3 g/dl before and 2.6 g/dl after 6 months’ CAPD. PET showed D/P Creatinine was high (0.96). Total Kt/V was 1.74. She experienced a periods of better life quality with CAPD at home and free of abdominal distension. On May. 29, 2010, she had an episode of peritonitis (Klebsiella oxytoca), which was soon under control by IP empiric antibiotics. But, she experienced acute myocardial infarction (AMI) with respiratory failure during admission. CAPD therapy was continued in ICU with good renal support. Finally she was discharged with home ventilator on Aug. 19, 2010. Our nursing staffs did home visit and follow up.

**Discussion**

There are remarkable findings in the treatment course:
1. Hemodynamic tolerance was excellent during the PD course. PD is like a kind of CRRT that performs continuously and slowly UF to avoid hemodynamic instability. The PD formula also can be adjusted elastically according to patients’ conditions.

2. Massive ascites (>5,000 cc) was drained and no hemodynamic change was occurred during PD catheter implantation. Two of our patients had prevented albumin supply before operation. But, whether the necessity of pre-operation albumin correction or not needs further observation.

3. Massive ascites (the largest one was > 10,000 cc/d) was drained initially and which was gradually returned to normal volume (800-1,000 cc/d) within 1-6 months. The PET of our patients was high which meant very fast solute balance and less UF effect. Therefore, the initial large amount of UF was ascites caused by LC with portal hypertension. The portal hypertension gradually overcome by hyper-osmolar dialysate and the UF volume gradually returned to an acceptable range. At the same time, the high PET peritoneum didn’t present low UF rate due to ascites formation.

4. Hypoalbuminemia was a prominent feature in these patients because of ascites and dialysate loss. This condition will be gradually improved along with the duration of PD and decreasing portal hypertension. If nutrition is adequate, the albumin level will keep at low limit of normal range.

5. Peritonitis episodes happened in all our patients, which were caused by operation skill failure, self-cutting catheter, and intra-abdominal origin. But, IP antibiotics had easily treated all these episodes of peritonitis. One study reported that the peritonitis rate is the same between cirrhotic and non-cirrhotic PD patients.

6. Two of our patients had admitted to ICU because of shock caused by sepsis and hypovo-
PD in liver cirrhosis and ascites

Peritoneal protein losses, initially high, decreased over time which can be alleviated by adequate nutrition supplement.

The incidence of peritonitis was similar between cirrhotic and non-cirrhotic PD patients. In conclusion, PD can be as the first choice for cirrhotic patients with ascites and that need to start dialysis. Furthermore, we suppose it is time to introduce PD instead of HD or CRRT for these groups of patients in the ICU.

References


Conclusions

ESRD patients with chronic liver disease and ascites are more difficult to manage on dialysis due to several problems, including ascites and other complications of advanced liver disease. HD is associated with an unstable hemodynamic status due to rapid UF as well as increased potential of encephalopathy and an increased risk of bleeding. Although CRRT and SLEDD can overcome the hemodynamic instability and give adequate urea clearance, ascites and risk of bleeding still persist. In addition, mass facility, high cost, lack of flexibility, and waste of manpower are all their disadvantages.

PD offers several advantages such as hemodynamic tolerance was excellent, solute & water peritoneal transport increased and effective ascites removal. Morbidity and mortality were related principally to liver disease and other comorbidities.

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References

腹膜透析在末期腎衰竭併肝硬化及大量腹水病人的治療經驗

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摘要

末期腎衰竭併有肝硬化及腹水的病人，常處於一種危急的狀態，很難以傳統的血液透析方式來治療，甚至是連續性的腎臟替代療法。因爲容易加重血行動力狀態的不穩定及出血的危險性。對於這類病人，腹膜透析是一種較佳而且有效的治療選擇。腹膜透析不僅可以使血行動力狀態穩定，降低出血的危險性，提供更具彈性的操作方式，而且可以降低人力及設備成本的耗費。因此，我們搜集了 3 例末期腎衰竭併肝硬化及腹水而接受腹膜透析的病人。第一位是 77 歲的男性，充血性心衰竭、末期腎衰竭、C 型肝炎併肝硬化及腹水，在接受 6 個月的血液透析後，因為嚴重的透析中低血壓及惡化的腹水，而轉為腹膜透析。第二位是 53 歲的男性，因糖尿病腎病變造成末期腎衰竭及 B 型肝炎併有大量腹水，而開始接受腹膜透析。第三位是 75 歲的女性，因糖尿病腎病變造成末期腎衰竭、C 型肝炎併大量腹水、充血性心衰竭，而接受腹膜透析。這三位病人對腹膜透析的耐受性都很好。即使治療初期，每天腹水的引流量在 5000 c.c. 以上，血行動力狀態仍能維持穩定。腹膜透析不須使用抗凝劑，可進行持續性的尿毒素清除，可經由透析液作能量補充，而且由於腹水的消除，可以提供病人較佳的生活品質。總之，末期腎衰竭併肝硬化及腹水或肝硬化併腹水惡化至末期腎衰竭是加護病房常遇到的狀況。相較於血液透析 (HD)、連續性的血液過濾 (CVVH) 及低流速、低效率的每天血液透析 (SLEDD)，腹膜透析是一種較佳的治療選擇。

關鍵詞：末期腎衰竭，腹膜透析，血液透析，腹水，肝硬化

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