Early Technique Success After Initiation of Treatment with Urgent-Start Peritoneal Dialysis

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In the United States, interest has recently been renewed in the more urgent initiation of peritoneal dialysis (PD) to avoid temporary vascular access catheters in appropriate patients presenting late in the course of their kidney disease. Urgent-start PD programs have been established across the country, requiring new infrastructure and processes of care.

Less is known about early technique success after urgent initiation of PD. In this report, we describe 90-day technique success and causes of hospitalization in 81 patients initiating PD in our urgent-start pathway.

Key words
Urgent-start PD, late-referral PD, technique success

Introduction
Initiating peritoneal dialysis (PD) more urgently, before the traditional break-in period after PD catheter placement, is increasingly being described in patients presenting late to a nephrologist or with unexpected deterioration in underlying chronic kidney disease (1–3). These late-referred patients have nearly universally been treated with hemodialysis (HD) via temporary vascular access catheters, which carry the burden of increased rates of bacteremia, sepsis, and death, and which require subsequent surgical procedures for removal and replacement with a more permanent vascular access (4,5).

The benefits of initiating PD even in late-referred patients needing more urgent initiation of dialysis are the reduced number of subsequent procedures, the known benefit of better preservation of residual kidney function, the lifestyle implications of home dialysis, and the reduced costs associated with urgent-start PD (6–8).

Compared with patients initiating dialysis in an elective, planned way, patients requiring urgent initiation of dialysis potentially have many clinical distinctions. Unplanned, late-referred patients are often older, have more comorbidities, are more anemic and deficient in vitamin D because of a lack of pre-dialysis medications, and present with a more advanced state of uremia (3). Comparing clinical outcomes in the groups therefore requires careful case adjustments to account for the inherent differences.

One clinical outcome of interest in the late-referred dialysis population initiating urgent-start PD would be the initial PD technique success at 90 days. The initial 90 days of PD therapy have been associated with higher rates of technique failure, and initiating PD more urgently could therefore be expected to further increase the technical difficulties leading to technique failure. We sought to better characterize PD technique success after urgent-start PD in a large cohort of patients from a U.S. nephrology practice that has adopted an urgent-start PD care pathway in two facilities within the practice.

Methods
Urgent-start PD was defined as initiation of PD before the traditional 14-day waiting period after catheter placement. All catheters were placed by a laparoscopic method and typically were used within 3 – 6 days after surgery. Some catheters were used immediately or 1 day postoperatively. After catheter implantation, initial PD treatments were nurse-assisted, with patients positioned in the recumbent position and a cycler device delivering low-volume dialysate exchanges. Our detailed urgent-start implementation procedures and infrastructure were extensively described in a recent publication (9).
After initiation of urgent-start PD, patient data were collected by the PD unit in spreadsheet format and reconciled with the in-center HD records for patients urgently transferring from HD to PD, patient tracking documents provided by the dialysis provider, and physician clinic and hospital notes. Hospitalizations were further tracked and reconciled using dialysis provider billing and charting systems that track hospital admissions, discharges, and discharge diagnoses. Patients were tracked for 90 days after urgent-start PD initiation.

Results
Between January 1, 2011, and September 1, 2013, 81 patients (54 white, 16 Hispanic, 7 African American, 3 Pacific Islander, 1 Native American) were admitted to our two PD units via the urgent-start PD pathway. Of those 81 patients, 70 were new to dialysis, and 11 were urgent transfers from in-center HD (Table I). Of the 11 transfers, 2 were transferred because of vascular access complications, and 9 elected to convert from HD to PD.

Within the first 90 days after initiation of urgent-start PD, 6 of 81 patients (7.4%) either transferred to HD, recovered renal function and discontinued dialysis, or died (Table I). Excluding the 1 death and the 1 spontaneous renal recovery, 95% of urgent-start PD patients elected to remain on PD during the 90 days of follow-up.

Table II details hospitalization episodes and causes of hospitalizations. Within 90 days, 25 hospitalizations were recorded among the 81 urgent-start patients entered into the PD program, with 13 patients having 1 hospitalization each and 6 patients having 2 hospitalizations each. Non-renal problems were the main causes of hospitalization, with PD complications being limited to fluid imbalance (16% of the admissions) and PD catheter malfunction (8% of the admissions). Notably, no hospitalizations for peritonitis occurred in the first 90 days.

Discussion
This report documents initial technique success at 90 days after urgent initiation of dialysis in patients who were new starts to dialysis or who transitioned from HD either by choice or because of vascular access issues. Of the 81 patients followed for 90 days after urgent initiation of PD, only 6 discontinued the technique (Table I). As mentioned, the primary reason for PD technique failure was patient choice (n = 4); 1 patient recovered renal function, and 1 died. Most patients entering the urgent-start PD clinical pathway remained on PD therapy at 90 days (92.6%), demonstrating reasonable initial technique success and acceptance of the modality despite the receipt of only expedited modality education opportunities in the pre-dialysis period.
In addition to overall technique success at 90 days, hospitalizations during that period were examined (Table II). Notably, only 24% of hospitalizations during the 90-day period could be attributed to a dialysis complication: fluid imbalance in 16% of admissions, and PD catheter malfunction in 8%. Causes of the remaining 76% of hospitalizations were largely related to other comorbidities. Our analysis is limited, however, by not having access to secondary diagnoses for the hospitalizations. But taken together, our data suggest that initiating PD in a late-referred patient can be an effective alternative to the traditional default option of in-center HD with a temporary vascular access catheter.

Our results can be compared with those in other reports from the literature. In an initial U.S. publication on urgent-start PD, all 15 patients initiating PD by an unplanned, urgent PD pathway remained on PD at 90 days of observation (1). In another small U.S. report of 11 patients urgently initiated on PD, the authors noted that 10 of the 11 remained on PD at 90 days of follow-up; the single transfer away from PD occurred because of transplantation at day 60 (2; Groenhoff C. Personal communication). We now add to those smaller U.S. reports, documenting the 90-day technique success rate in 81 patients treated with urgent-start PD. Remarkably, 75 of the 81 patients remained on PD at 90 days. After PD initiation, the patients were given additional modality education so that they could better understand their lifestyle options, and only 4 of the 81 patients requested a modality change to HD. The latter observation suggests that, after initiation of dialysis with a specific modality, there is often reluctance on the part of the patient to request a change in therapy—a phenomenon known in the HD setting, where late-referred patients starting in-center HD with a temporary vascular access are less likely to convert to a home modality. We also believe that the initial nurse-assisted treatments allowed patients to initiate the therapy with assistance, to improve their clinical sense of well-being, and to value the lifestyle options afforded by PD. These patients will typically require no further surgical access procedures and are reluctant to consider the additional surgeries that would be needed to convert to HD.

Additional urgent-start PD reports from outside the United States suggest acceptable early technique success. Lobbedez and colleagues in France described rapid initiation of PD in 34 unplanned dialysis patients and compared outcomes in that group with outcomes in 26 patients initiating unplanned HD with a temporary vascular catheter (10). Using lower-volume exchanges, PD was initiated at a median of 4 days after catheter implantation. The actuarial PD technique survival was 90% at 6 months and 88% at 1 year. Similarly, in a Danish report by Povlsen and Iversen, 52 patients were urgently started on PD as their first treatment for end-stage renal disease, and overall 3-month PD technique survival was 75% (11). Our report and the others described here are, however, from more experienced urgent-start PD centers; outcomes might be less successful in newer programs without experience and established protocols.

Conclusions
In an ideal scenario, patients requiring initiation of dialysis for chronic kidney disease would start dialysis electively, in the outpatient setting, with a previously created and matured access. However, most patients continue to start dialysis in an unplanned way with HD using a more morbid temporary vascular access catheter. However, urgent PD initiation in patients referred late to nephrologists or experiencing an unexpected deterioration in renal function—with the consequent avoidance of exposure to temporary catheters and subsequent access procedures—is increasingly being reported. The infrastructure and nursing requirements for urgent-start PD have been established in many PD centers. Our 90-day technique outcomes after urgent initiation of PD lead us to conclude that this clinical pathway is a viable option for the patient requiring more urgent initiation of dialysis.

Disclosures
AM is an employee of DaVita Healthcare. SG is an employee of Baxter Healthcare Corporation. VK is a nephrologist at Southwest Kidney Institute.

References


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