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Peritoneal Dialysis Should Be Considered the First Option for Patients Requiring Urgent Start Dialysis: CON

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Peritoneal dialysis (PD) is a dialytic therapy that utilizes a patient’s peritoneal membrane for clearance and ultrafiltration. PD is a home dialytic modality; PD is performed at home by the patient with at least twice monthly visits to a dialysis clinic for physician and nursing care. Since therapy is performed at home by the patient, selection must take into account the ability of the patient to safely and adequately perform therapy. Patient counseling usually starts months prior to initiation of dialysis in order to select for appropriate patients, refer for catheter insertion, and allow catheter maturation while commencing an in-depth two to four week training session. Based on certain observational studies, PD results in improved quality of life, improved survival relative to hemodialysis (HD) in the early years of therapy, improved costs, avoidance of vascular access related complications, and better preservation of residual kidney function. As a result of these outcomes, PD has garnered popularity amongst nephrologists as a preferred modality.

**Defining Urgent Start Peritoneal Dialysis**

In efforts to expand the PD population, the concept of urgent start PD has gained some acceptance (1). Urgent start PD refers to the near-immediate initiation of PD after catheter insertion for patients with either known chronic kidney disease (CKD) or CKD previously undiagnosed who present with uremia, electrolyte abnormalities, acidosis or volume overload who cannot be treated or temporized with medical therapy in whom dialytic therapy has not been decided upon (2). By removing a careful and well-thought-out patient selection process, urgent start PD exposes ill-informed and improperly matched patients with a modality that has long since been revered by nephrologist, thereby access related complications, therapy associated risks and long-term modality concerns into its ethos.

When looking at reports of urgent start PD programs there is extreme variability as to the definition of urgent start (3). Creating a uniformed definition is important when recommending a life-altering treatment that has significant implications. Urgent start PD should refer to the insertion of a catheter and initiation of PD within 48 hours in either the inpatient or outpatient setting. A central venous catheter (CVC) should not be inserted and HD
initiated in order to optimize the patient in order to begin PD; this pathway does not embrace the true HD-sparing objective of urgent start PD. In some programs, patients can only be started in the outpatient setting and any urgent inpatient treatments are commenced with HD started through a central venous catheter. Other programs will start a patient urgently within 2 weeks but not 48 hours of the need for dialysis. The latter will require CVC placement and HD. This variability in the literature is misleading in that it is creating an incohesive body of literature that makes it difficult and dangerous for nephrologists to use as a guide when considering the implementation of an urgent start program.

Peritoneal Dialysis Catheter Insertion

A PD catheter can be inserted by an interventional technique or through open or more often laparoscopic surgery. Complications from PD catheter insertion include surgical complications such as bleeding or bowel perforation or perioperative complications such as catheter site leakage of dialysate, peritonitis, exit site infection, or the development of hernias associated with catheter insertion (4). When thinking about the complications associated with a catheter that is inserted for urgent start PD, it is important to compare access complications to both catheter insertion associated with non-urgent PD placement and central venous catheter insertion for urgent start hemodialysis. A recent study by Wang et al. looked at access related procedures in patients undergoing urgent start dialysis. In looking at 50 patients undergoing central venous catheter (CVC) insertion and 23 patients undergoing PD catheter placement, the number of access related procedures was similar between the two groups at 30 days (5). Furthermore, infection related complications were no different between the two groups. However, when looking at the two groups, the patients in the PD group were more likely to be younger, have a lower serum potassium, less diabetes, and more likely to have an access already placed, yet not matured. While this study does support the use of urgent start PD as having equivalent access related complications to that of HD, it is difficult to relate these patients to patients who present who have not had a discussion on modality choice, since 30% of patients in the PD group already had a catheter placed.
A second study by Hernandez-Castillo et al. looked at 102 patients who underwent urgent PD over a four- and half-year period (6). Catheters were used within 72 hours of insertion. Catheter leakage occurred in 7.8%, catheter dysfunction in 26.5%, catheter removal in 5.9%, and peritonitis in 13.7% of patients, numbers which are remarkably high. These complications lead to significant healthcare expenditures and potential morbidity for the patient. Literature is quite variable on catheter related complications, for example with leak rates varying between < 1% to > 10% depending on studies (7). Some of the variability does relate to radiologist, nephrologist, or surgeon experience at catheter insertion. This is an important point to consider since adopting PD as an urgent start modality will require experienced surgeons or proceduralists to result in favorable outcomes; creating a culture of preferred urgent start PD may result in inexperienced providers inserting catheters thereby exacerbating negative outcomes and in the case of peritonitis, possibly preventing use of PD as a modality.

**Peritoneal Dialysis Prescription**

Urgent start PD is achieved with low fill volumes (usually 1.2 liters or less) administered supine with a cycler to minimize intra-abdominal pressure. However, there is significant variability in terms of fill volumes, duration and cycled versus manual exchanges in studies (8). Regardless of the variability, there was no difference in outcomes or safety in patients who underwent urgent start PD. When looking at studies that have looked at urgent start PD, the indication for dialysis was most often uremia. Uremia was defined as a blood urea nitrogen (BUN) value above a certain number, without commenting on direct symptoms of uremia that may be impairing quality of life or leading to medical comorbidity. It is unclear whether dialysis was truly indicated as a life-saving necessity in these patients. There was no mention of medical management to treat uremia. There was also no marker of improved uremia. With low volume PD, adequacy may be difficult to achieve, is largely influenced by residual renal function and membrane transport characteristics, and it is possible that symptoms are not being corrected. If the reason to start is reserved for uremic patients based on a BUN cutoff, then the use of
urgent start PD may be adopted unnecessarily, allowing for more catheter related complications.

Very few studies commented on the need for dialysis to correct volume overload or hyperkalemia. This suggests that urgent start PD is not ideal for patients with extreme volume or electrolyte concerns. The studies do not mention potassium management or control within 14 days of initiation of urgent start PD. This is a very critical complication of CKD. It is known that PD is inferior in acute removal of potassium relative to HD (9). This is extremely important to distinguish since adopting PD as an urgent start modality may not be preferred in patient with extremes in potassium, hypervolemia, or acidosis. While these can be achieved in a hospital setting with direct nursing care, utilizing in this fashion will significantly increase the cost of urgent start PD.

**Logistical Concerns with Urgent Start Peritoneal Dialysis**

Patients who choose PD as a modality are usually vetted well. Concerns regarding patient candidacy involve a strong knowledge of the psychosocial aspects of the patient that can influence long term success. These include a safe and stable home, preferred but not the absolute of caregiver support, compliance towards medical treatment and the ability to engage in self-care. Training a patient for PD is a nursing intense process that can take several hours per session for two to four weeks (10). This investment is the reason why careful patient choice is so important. Studies have shown upwards of 13% of patients on urgent start PD undergoing a modality change in between 3 to 12 months of follow up. This rather high percentage of patients undergoing modality change is concerning given the upfront investment that is placed in training patients for urgent start PD.

**Conclusions and Future Perspectives**

A recent Cochrane review looking at 16 studies comparing urgent start PD and conventional start PD found no benefit in urgent start PD and demonstrated and increase risk of catheter leakage (11). Given that leakage is associated with increased infection, urgent start PD places the patient at unnecessary risk and reduces the effectivenss of thius revered modality.
Going forward urgent start PD needs to be explored more carefully as a possible modality, however patient selection is crucial. My practice does not utilize urgent start PD, but instead we take advantage of a transitional care unit (TCU). In patients undergoing urgent start dialysis, HD is initiated with a CVC. The patient is then transitioned to the home unit to undergo HD and learn about in center HD, home HD, and PD. A joint decision is made between the patient, nursing staff, and nephrologist. CVC use is limited to less than 4 months with this method.

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