

Chapter 22: Peritoneal Dialysis in Elderly Patients

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The issue of whether—and how—to implement peritoneal dialysis (PD) in elderly patients is increasingly important given the rapid growth of this dialysis population. PD has some particular advantages and disadvantages in the elderly. Furthermore, these advantages and disadvantages are not always fully understood by medical providers. Not only is a better understanding of PD in elderly patients relevant for patient autonomy, medical outcome, and comfort, but there are systemic implications for cost and education as well.

BACKGROUND AND EPIDEMIOLOGY

In the United States, PD is used less frequently in elderly patients than in younger patients, and the rate is declining. In recent USRDS data, 12% of patients ages 20 to 55 were on PD, whereas only 4% of dialysis patients >75 yr of age used this modality.¹ This contrasts strikingly with other countries. In France, PD is dominant in elderly patients, with more than one half of all PD patients being >70 yr old. In Hong Kong, 80% of all dialysis patients are on PD, with a median age of 62. The United Kingdom and Canada are intermediate, with 17 and 12% of incident elderly dialysis patients treated with PD.²

The cost of PD is generally less than that of hemodialysis (HD).³ Because elderly patients are the fastest-growing segment of the dialysis population, their relatively infrequent use of PD has financial implications.

The reasons for the wide variation in use of PD in elderly patients are multifactorial, including financial, resource availability, and cultural issues. However, a particular concern is that unfamiliarity of providers with the use of PD in elderly patients leads to a self-perpetuating cycle of underuse. This is especially of note because, given the opportunity, many elderly would elect PD. It is not always an option; in one study, it was considered contraindicated for medical or social reasons in about one half

of patients older than 65 yr. However, if there was not a contraindication, one third of elderly patients elected to start PD rather than HD.⁴ Elderly patients on PD can do quite well: the 2- and 5-yr survival of patients over 65 yr of age in Hong Kong was reported to be 88 and 56%, respectively.⁵

In comparing PD and HD, one should keep in mind that data quality is limited by the inability to randomize patients. The larger prospective cohort studies such as the NTDS have subject numbers in the hundreds, whereas registry studies are larger but presumably are confounded by selection bias. Furthermore, all comparisons are complicated by varying definitions of what age constitutes “elderly.” Most use >65 as a cut-off, whereas others use 70 or higher.

PHYSIOLOGY OF PD IN ELDERLY PATIENTS

The fundamental physiology of PD is not age dependent; a rich capillary plexus brings blood into the peritoneum and filtrate flows across the peritoneal membrane into the dialysate. However, there are several physiologic considerations unique to elderly patients that may affect clinical outcomes. Emerging data suggest that peritoneal mesothelial cells change during the aging process and may be more prone to inflammation. Whether this observed proinflammatory profile in elderly patients actually has clinical significance remains untested at this point.

In addition to possible age-related changes in the peritoneal membrane, elderly patients have a higher incidence of intestinal pathology, including diverticulosis, bowel perforation, and constipation. All of these can affect the underlying physiology of

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the membrane, as well as the functionality of the peritoneal catheter. In addition, many elderly patients have undergone previous abdominal surgeries, which will increase the risk of adhesions and potential abdominal wall leaks.

GENERAL CONSIDERATIONS IN CHOOSING PD VERSUS HD

Both PD and HD pose challenges for elderly patients. PD requires an appropriate living situation, some degree of mobility and vision, a peritoneum not disrupted by prior surgeries, and the ability to learn and independently perform a daily medical technique. Although many elderly can accomplish this, for very elderly patients (>80 yr old), >60% may require assistance.⁶ However, PD has the advantage of being physiologically gentle and can be performed at home.

HD requires less technical participation, but there can be a substantial cost in time spent in the procedure and traveling to dialysis units, especially if transportation assistance is needed. The dialysis procedure can also be particularly exhausting for elderly patients. Furthermore, vascular access can be difficult in this population.

DOES SELECTING PD VERSUS HD AFFECT MORTALITY IN ELDERLY PATIENTS?

Because of the inability to randomize, this question has not been definitively answered, and studies have had conflicting results. However, in general, mortality is similar. In one case, the NTDS prospectively followed 125 patients in the United Kingdom over the age of 70 who were initiating dialysis. Although this was not randomized, nearly one half (44%) started PD, indicating that assignment to PD was fairly liberal. The HD and PD groups had the same rates of hospitalization and death.⁷

From databases, the REIN study in France found that elderly PD patients as a whole did as well as HD patients, although perhaps slightly worse once unplanned HD starts (who were presumably more ill) were discounted. Finally, one US database review found that death rates for nondiabetic patients over 65 without other comorbidities were slightly lower on PD than on HD, whereas the reverse was true for diabetics with or without comorbidities in the same age group.⁸ These data need to be generalized with caution because these were registry studies and the effect sizes were not large.

Overall, it seems that on the basis of mortality outcome alone, there is no compelling reason to either avoid or select PD in elderly patients.

ARE THERE DIFFERENCES IN INFECTION RATES BETWEEN ELDERLY AND YOUNG PATIENTS ON PD?

There have been conflicting data, with studies showing both

higher and lower peritonitis rates, as well as showing both a negative and a neutral effect of having visiting assistance. Overall, the data do not show a consistent difference. For example, a recent study found that, in comparing incident patients over 65 *versus* under 65, all of whom were performing their own care, there was no difference in the probability of being peritonitis free for 12 mo (76.6 *versus* 76.5%).⁹ When peritonitis does occur, several studies have found different proportions of causative organisms than are seen in younger patients. However, these studies are not consistent in their findings, and there is no recommendation for different empiric treatment on this basis. Interestingly, there is evidence that exit site and tunnel infections are less common in elderly patients, perhaps because of less vigorous activity.⁶

IS THERE A DIFFERENCE IN QUALITY OF LIFE BETWEEN HD AND PD FOR ELDERLY PATIENTS?

In younger patients, PD is often associated with a better quality-of-life rating than HD, although this is likely in part because of self-selection. There are limited data specifically in older patients, but overall, elderly patients report the same quality of life whether on HD or PD.¹⁰ Of course, PD may be particularly appropriate for individual patients who place a high value on independence or who would prefer to dialyze at night.

IS THERE A NUTRITIONAL CONSEQUENCE TO PD?

In general, elderly patients on any kind of dialysis have poor nutritional status. The data comparing PD to HD are scant, but there is no clear evidence that nutritional status is poorer in the elderly PD patients despite potential protein losses in the effluent.⁶

WHAT IS AVAILABLE TO ASSIST ELDERLY PATIENTS ON PD? WHO CAN HELP?

There are a number of devices designed to accommodate physical disabilities, some of which might apply to the elderly. For example, there are devices to help “spike” PD fluid bags automatically, and there is a desk-mounted clamp that allows one-handed operation of the transfer set. There are also magnifying devices that can be adapted to assist with the process.

However, often the elderly will require personal assistance as well, especially if there are cognitive deficits. Commonly, this support is provided by a family member, and this can impose a considerable burden on the caregiver. One study found that caregivers spent an average of 56 h/wk in care of elderly PD patients. Although this was less than the time reported for caregivers of elderly HD patients requiring assistance, several markers of quality of life were lower for the PD caregivers.¹¹

This burden can perhaps be simplified by the common practice of using automated cyclers, which do not have a higher technique failure rate in the elderly. In addition, in some circumstances, a community nurse may visit twice daily to connect and disconnect an automated cycler, a practice known as assisted automated PD. Although the availability of this varies, it could dramatically expand the range of candidates for PD. One center in Denmark with aggressive PD enrollment reported good success in starting patients over 65 on PD, with approximately one half overall using assisted automated PD. This included nearly 50% unplanned starts, *i.e.*, patients who required initiation of dialysis less than 9 d after PD catheter placement. The ability to start dialysis initially on PD is important, because patients tend to stay with their initial mode of dialysis.¹²

When a patient is not at home but instead in an assisted living facility, there may still be PD options, although these are rare. Staff turnover limits the training for PD among nursing staff, but it is available in some facilities.

CONCLUSIONS

Contrary to general assumption, there is no dramatic difference in clinical outcomes in elderly patients who are on PD *versus* those on HD. Furthermore, quality of life seems to be at least as good. Although the available information may be affected by selection bias, these conclusions remain even in cohorts that have a high use of peritoneal dialysis, indicating that they may nevertheless be generalizable.

Nevertheless, rates of PD in the elderly are very low in the United States, implying underuse. The elderly already tend to have less predialysis care and a greater need for urgent dialysis starts, both factors that tend to increase the initial use of HD over PD. It is important for nephrologists to recognize this disparity and guard against assumptions on the basis of age that would prevent advocating for PD. Particularly for patients valuing the PD lifestyle, PD should be offered to the elderly among their dialysis options.

TAKE HOME POINTS

- PD is rare and probably underused in elderly patients in the United States

- There is no substantial mortality difference between PD and HD in elderly patients
- Quality of life is not reported to be different between elderly patients on PD compared with HD
- Infection rates are not higher in elderly *versus* younger PD patients
- Assistants or commercially available devices may make PD more accessible to some elderly patients

DISCLOSURES

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REVIEW QUESTIONS: PERITONEAL DIALYSIS IN ELDERLY PATIENTS

1. Peritoneal dialysis in the elderly:
 - a. Is associated with a higher mortality than hemodialysis
 - b. Is associated with a higher rate of peritonitis than in younger patients, especially gram-negative organisms
 - c. Should be considered primarily for patients who have no vascular access options for hemodialysis
 - d. Unlike in younger patients, is not associated with improved quality of life ratings when compared with hemodialysis
2. The proportion of elderly dialysis patients using peritoneal dialysis in the United States:
 - a. Is about 12% and has been stable over the last 10 yr
 - b. Is about 10%, which is similar to most other countries
 - c. Is about 5%, but rising as adaptive technologies and home care make it more accessible despite functional impairment
 - d. Is about 4% and falling
3. Peritoneal dialysis in the elderly is:
 - a. The preferred modality in some countries
 - b. Desirable, but felt to be contraindicated nearly 90% of the time by medical or social assessment
 - c. Is rarely selected by elderly patients to whom it is offered because of the logistical difficulties it entails
 - d. Has been shown to be a poor choice as a means of initiating dialysis unless the initiation is planned several months in advance
4. Peritoneal dialysis is:
 - a. Available by law in the United States in all nursing homes where hemodialysis is offered
 - b. Associated with better ratings of caregiver quality of life than is seen in caregivers of patients on hemodialysis, although this may largely be because of self-selection
 - c. May be associated with lower rates of tunnel infection than in younger patients
 - d. Associated with substantially poorer nutritional status than hemodialysis in elderly patients, presumably because of protein losses in the effluent