Peritoneal or hemodialysis for the frail elderly patient, the choice of 2 evils?

Edwina A. Brown[1], Frederic O. Finkelstein[2], Osasuyi U. Iyasere[1] and Alan S. Kliger[3]

[1]Imperial College Kidney and Transplant Centre, Hammersmith Hospital, London, United Kingdom; [2]Yale School of Medicine, New Haven, Connecticut, USA; and [3]Yale School of Medicine and Yale New Haven Health System, New Haven, Connecticut, USA

Management of older people on dialysis requires focus on the wider aspects of aging as well as dialysis. Almost all frail and older patients receiving dialysis will default to in-center hemodialysis, although the availability of assisted peritoneal dialysis enables dialysis at home. As with any disease management decision, patients approaching end-stage renal disease need all the appropriate facts about their prognosis, the natural history of their disease without dialysis, and the resulting outcomes and complications of the different dialysis modalities. Hemodialysis in the older age group can be complicated by intradialytic hypotension, prolonged time to recovery, and vascular access–related problems. Peritoneal dialysis can be difficult for older patients with impaired physical or cognitive function and can become a considerable burden. Use of incremental dialysis, changes in hemodialysis frequency, and delivery and use of assistance for peritoneal dialysis can ameliorate quality of life for older patients. Understanding each individual's goals of care in the context of his or her life experience is particularly important in the elderly, when overall life expectancy is relatively short, and life experience or quality of life may be the priority. Indeed, some patients select the option of no dialysis or conservative care. With multifaceted assessments of care, physicians should be able to give individual patients the ability to select and continue to make the best decisions for their care.

Kidney International (2016) ■, ■–■; http://dx.doi.org/10.1016/j.kint.2016.08.026

KEYWORDS: geriatric nephrology; hemodialysis; peritoneal dialysis

Correspondence: *Edwina A. Brown, Hammersmith Hospital, Du Cane Road, London W12 0HS, United Kingdom. E-mail: e.a.brown@imperial.ac.uk*

Received 15 June 2016; revised 5 August 2016; accepted 8 August 2016

"The good physician treats the disease. The great physician treats the patient who has the disease." So wrote Sir William Osler more than a century ago.[1] This observation is even more pertinent today with an aging population. The impact of aging on health and the response to illness is not, however, related to chronological years. Other factors associated with aging, such as the number of comorbidities and overall day-to-day functioning, both physically and mentally, and frailty, have a much greater role in determining outcomes and life expectancy, and therefore need to be assessed. Many interventions, including dialysis, can have a considerable negative impact on the day-to-day living of individuals and their families, but yet may be of benefit in alleviating some symptoms and sometimes extending life. Given the potential distress to patients and their families as well as the cost of these interventions, it is not surprising that there is now considerable debate in the lay and medical press about quality or quantity of life for individuals with limited life expectancy.

Nephrology is not immune to this debate. The incidence of end-stage renal disease is highest in the >75-year-old age group.[2,3] In France, for example, 39% prevalent dialysis patients are older than 75 years of age.[4] Over the past few years, however, there has been mounting concern that older frail patients can have very poor outcomes on dialysis.[5] It has therefore been suggested that dialysis should be regarded as part of an overall management plan with the goals of the dialysis component being tailored to the needs of the older patient.[6,7] For example, an increasing number of patients are started on dialysis for heart failure while still having significant residual renal function. Dietary protein and sodium intake, physical activity, and energy expenditure, all of which will be low, will affect the rate of generating metabolic waste. The dialysis clearance target may therefore be lower than that required for younger, more active patients.

As a population, older dialysis patients may present later for dialysis,[8] have a greater number of comorbid conditions, are at greater risk of cognitive dysfunction,[9] and have increased levels of frailty[10,11] and potential sensory impairments.[12] Socially, this may lead to increased difficulty coping at home alone due to functional and psychological dependencies[13] with a larger burden on patients' caregivers, or, alternatively, patients may sometimes be caregivers themselves.[14] It is perhaps not surprising that the propensity for functional limitations and challenging social circumstances has traditionally curtailed the self-care dialysis treatment options

available to older patients. Almost all frail and older patients receiving dialysis will default to in-center hemodialysis (HD). In the United Kingdom, only 11.3% of prevalent dialysis patients 75 years of age and older are on peritoneal dialysis (PD) compared with 21.1% in those younger than 55 years of age.[15] Similarly, in the United States, 5.5% prevalent dialysis patients 75 years of age and older are on PD compared with 8.7% in the 22–44-year-old age group.[3] This pattern is replicated in many European countries with patients 70 years of age and older being 56% less likely to receive PD than those in the 20- to 44-year-old age group.[16] Yet, in response to a questionnaire at the British Renal Society meeting in July 2015, only 7 of 114 individuals agreed with the statement "hemodialysis is the optimal dialysis modality for older people" (E. Brown, personal observation).

Impact of frailty on outcomes

We need to understand the concept of frailty to consider why and when goals of care and medical interventions for individuals as they age should differ from those who are younger and fitter. Clinically, frailty presents as a composite of poor physical function, exhaustion, low physical activity, and weight loss and is associated with an increased risk of falls, cognitive impairment, hospitalization, and death.[17] A predictive measure of frailty can easily be assessed by clinicians and is based on clinical judgment of the patient's fitness and dependence on others.[18] Frailty has been recognized as being more common in the CKD population independent of age for some years.[10,11] More recent studies have shown that similar to the general population, frailty in predialysis and dialysis patients is associated with increased cognitive dysfunction[19] and mortality.[20–22] A cross-sectional analysis of the baseline data in the FEPOD (Frail Elderly Patient Outcomes on Dialysis) study recently showed that frailty is also associated with worse quality of life (QoL) scores for patients on dialysis, independent of modality. Hospitalization rates (>40% in the previous 3 months) were high and falls (one-third of patients in the previous 6 months) were common in this group of patients.[23]

Goals of treatment on dialysis

Determination of the degree of frailty enables the clinician to evolve a holistic treatment plan (Table 1). When considering dialysis, however, discussions often focus on "saving" life rather than prognosis and life expectancy or QoL. Yet there is ample evidence that individuals with limited life expectancy are mostly more concerned about quality rather than quantity of life.[24,25] Survival outcomes in older dialysis patients are generally poor. The median life years after starting dialysis (all modalities), in patients older than 75 years of age is 2 years according to UK registry data.[2] US Renal Data System data show that the adjusted survival rate for the same age group is 62.5% at 1 year and 17.1% at 5 years.[3] Not surprisingly, mortality rates increase with advancing age.[26] Decisions about dialysis modality or even dialysis or no dialysis should be made by the patient with or without the wider family unit depending on the individual's wishes and culture.[27] Understanding the impact of this decision on the patient and his or her family needs to be considered. As with any disease management decision, patients approaching end-stage renal disease need all the appropriate facts about their prognosis, the natural history of their disease without dialysis, and the resulting outcomes and complications of the different dialysis modalities.[28]

Table 1 | Clinical considerations for dialysis in frail patients

- Dialysis parameters
  - Timing of dialysis initiation
  - Hemodialysis related issues
    - Dosage: incremental, conventional (3 times per week), more frequent, or nocturnal
    - Intradialytic hypotension and associated ischemic problems
    - Transport requirements to attend dialysis sessions
    - Vascular access
    - Time to recovery
  - Peritoneal dialysis
    - Dosage: incremental or conventional (daily)
    - Ability of patient to learn technique
    - Need for and availability of assistance to perform dialysis
    - Need for social support from family or community
- Potential impact on
  - Symptom burden
  - Quality of life
  - Physical function
  - Cognitive impairment
  - Falls
  - Nutritional status
- Dependence
- Social support networks

Predicting prognosis. Informing patients accurately about prognosis is key to individualizing dialysis and associated supportive care. Physicians are often not good at doing this, with quotes in recent literature such as "if you're on dialysis you could last 10, 15, 20 years (male 76 years old)" or "you will probably have six years on dialysis (male 82 years old)."[29] The first report of octogenarians on dialysis included some prognostic markers with patients who were malnourished and with poor physical function and multiple comorbidities having the worst survival.[30] Subsequent analyses from American and European registry data have used multiple clinical factors to predict survival for patients starting on dialysis; these have included comorbidities, biochemical measurements, dialysis-related factors, and mobility.[31–34] Determination of a risk score reflects the median for the population to which the individual belongs and not a prediction for the individual patient. It does enable, however, objective stratification of individuals starting dialysis into low-, medium-, or high-risk groups of early mortality and therefore considering appropriate support and informed decision making.[31]

Outcomes of HD compared with PD. Given the limited life expectancy of frail older patients on any dialysis modality, the important comparison is QoL. Most of the comparative data available, however, are based on mortality, as this is easily extractable from registries. The North Thames Dialysis study,