Chronic Kidney Disease in the Elderly

By Vanita Jassal

Chronic kidney disease (CKD) is likely to be the most common condition managed by practicing nephrologists in elderly patients attending a nephrology clinic. Why? Because the majority of individuals with renal disease are 65 or older (Figure 1) and CKD is the most common renal disease in the older individual.

Although it is a common condition, and each one of us is clearly able to manage CKD, many would argue that CKD should be considered a different disease for older individuals compared with younger people. The disorders and other causes for most cases of CKD are different in younger individuals, the health implications differ, and, at least in some respects, the appropriate treatment is age-sensitive.

Despite having a common final pathway, CKD in elderly individuals is more likely to result from chronic, asymptomatic conditions such as vascular disease, hypertension, obstructive uropathy, or repeated acute kidney injury than from inflammatory or systemic renal diseases. Consequently, the clinical presentation may differ, the management may be multidimensional, and the outcomes may be more dependent on comorbid illnesses.

At a population level, multiple studies have clearly shown that the presence of CKD is associated with increased mortality (in particular cardiac mortality), prolonged hospitalizations, and poorer long-term health outcomes (such as need for renal replacement therapy, myocardial infarction, strokes, etc.) across all age groups. However, a significant number of studies also emphasize that the relative increase in risk is considerably lower for elderly individuals than younger counterparts. The implication is often that the presence of CKD is of lesser significance in older individuals than in younger individuals, but in fact, particularly when limited to those with a rapid decline in renal function (defined as those with a fall in eGFR of ≥5 mL/min/yr), the increase in absolute risk of mortality is impressive.

The older individual is at higher baseline risk of one or more adverse health outcomes (death, ill-health, hospitalization) and so even small increases in relative risk result in dramatic increases in absolute risk. For example, a person of 40 years with an estimated glomerular filtration rate (eGFR) of 30–39 mL/min has an absolute increase in annual mortality of 2.2 percent compared to someone with normal renal function, while for the 75-year-old the absolute increase in mortality is almost double at 4.2 percent each year.

Screening and diagnosis of CKD is also more challenging in elderly populations. Isolated, or even multiple reports of low eGFR need to be interpreted in the context of a complete medical and, if possible, geriatric assessment. Comprehensive geriatric assessments (CGA) may help early recognition of frailty, muscle loss, and psychosocial factors, all of which may be associated with decreased muscle mass and overall well-being. Although time consuming, incorporation of periodic comprehensive geriatric assessments into routine CKD care also helps determine the most appropriate care path as CKD advances. A variety of widely available tools are available online for both physicians and other allied health staff (http://www.healthcare.wcnc.edu/ger/geriatric-research-professionals).

All equations that estimate renal function from measured serum creatinine values include age as a key modifying variable. The most commonly used, the abbreviated 4-item Modification of Diet in Renal Disease study (MDRD eGFR) equation, uses age as a surrogate for change in body composition.

The assumption (which works well at a population level) is that as one ages, one has a gradual fall in body muscle content. However at the individual level this relationship may not hold true. The age at which muscle loss starts, and the rate of loss, varies considerably between individuals. Nonmedical factors such as financial independence, access to food, and ability to prepare food, influence overall health.

Individuals who are fortunate and can maintain their health, independence, and exercise level, often have a slow, somewhat predictable decline in muscle mass with age. In these individuals the use of the MDRD formula will likely underestimate renal function. On the other hand, individuals who are dependent on caregivers to buy or prepare food, have cognitive issues, or medical conditions predisposing to frailty or prefrailty characteristics such as weight loss or reduced exercise tolerance are likely to have already experienced a significant degree of muscle loss at an early stage of life. These individuals are more likely to have ‘normal’ or low serum creatinine levels and therefore run the risk of unrecognized CKD.

Both overdiagnosis and underrecognition of CKD are of considerable concern. In the former situation, the simple act of labeling an otherwise healthy individual as one with CKD is likely to lead to unnecessary additional testing and follow-up, medications, and possibly impact quality of life. On the other hand, underrecognition of CKD may lead to errors in drug dosing and possible inappropriate prescribing of nonsteroidal drugs or radiological contrast. Although initial excitement over alternative creatinine-based formulae or measures such as cystatin C has waned, the search for the perfect “renal troponin” continues. Currently, the most optimal seems to be ongoing follow-up and evaluation for proteinuria, with eGFR estimation, and/or cystatin C measurement.

One of the most important clinical differences between elderly individuals and younger patients with CKD relates to treatment planning and therapeutic targets. The CGA is again a valuable tool in identifying possible detrimental effects of the treatments traditionally used in CKD patients. CKD patients have higher levels of frailty, functional dependency and cognitive dysfunction and therefore are at higher risk of experiencing geriatric syndromes. Current blood pressure targets (<130/80) offer little survival benefit for older patients and, particularly in those with reduced mobility or a tendency to fall, emphasis must be placed not only on the absolute sitting blood pressure but also on postural changes.

Recognition of the financial circumstances of an older patient may influence drug prescribing, while environmental assessments may influence dialysis modality choices and/or nursing strategies.

In the advanced stages of CKD, patients and families are often educated about different renal replacement strategies. The CGA is again a useful tool at this point. Documentation of changes over time, noted on sequential evaluations, may help families and patients appreciate subtle but significant changes in their nonrenal health and help during discussions about dialysis and nondialysis care strategies, dialysis withdrawal, and advanced planning.

Barriers to home dialysis may be recognized and overcome early in the dialysis planning period. Discussions around fistula creation may be guided by CGA evaluation findings. Current

Figure 1. Prevalence of CKD in NHANES 1988–1994 and 1999–2004 by age group (reprinted from JAMA, 2007)
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guidelines suggesting preemptive fistula creation in patients planning for hemodialysis do not differentiate between the 40-year-old and 80-year-old patient with stage 4/5 CKD. However, older patients are at higher than norma risk of fistula failure-to-mature; death prior to dialysis-need; and only have modest survival rates after dialysis initiation.

In the recently published ASN geriatric nephrology curriculum Seth Wright and John Danzinger discuss in detail the benefits, and risks, of fistula creation and advocate caution and careful consideration prior to referral for surgery. One option is to consider delaying fistula creation for three to six months while the older patient is established onto dialysis and adjusts to their new lifestyle. The use of the CGA helps clinicians approach the detection and management of CKD in elderly individuals requires ongoing collaboration with allied health and palliative care teams, geriatricians, as well as the family and patient. An appreciation of the impact that renal disease has on diet, lifestyle and well-being is necessary. To this point, it is humbling and insightful to take a few minutes to hear the patient’s perspective (http://www.youtube.com/watch?v=E0CiMcJyW4). ○

Suggested reading

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Special Considerations for Dialysis in the Elderly

By Yi-Wen Chiu and Rajnish Mehrotra

I n the United States, as in many other developed countries, the incidence of treated end stage renal disease (ESRD) increases with advancing age; the highest rates are observed in individuals between the ages of 75 and 79 (Figure 1) (1). There is concern, however, that the functional rehabilitation of elderly dialysis patients is often unsatisfactory and the gain in life expectancy with renal replacement therapy is rather modest. This should not be surprising, because elderly patients with ESRD have a significantly greater burden of coexisting illnesses and are more likely to be frail.

Unique psychosocial issues that interplay with medical conditions must be factored in when planning for renal replacement therapy for the elderly. Consequently, nephrologists grapple with several important issues when dealing with an elderly patient with advanced chronic kidney disease (CKD): Is dialysis planning appropriate for all elderly CKD patients? Does dialysis therapy improve the functional status and increase the life expectancy of the frail elderly, and is there a role for maximum conservative therapy? Does dialysis increase the risk of death in elderly patients if started at a higher level of estimated glomerular filtration rate (eGFR)? Is one dialysis modality better than the other for elderly patients with ESRD?

Dialysis planning for the elderly: for whom, and when?

One of the areas in the field of nephrology with the greatest opportunity to improve the management of patients is the time of dialysis initiation. To improve the early outcomes of ESRD patients, it is often recommended that dialysis planning begin when the eGFR decreases to <30 mL/min/1.73 m². However, several epidemiologic studies from unselected populations have shown that in patients with advanced CKD, the risk for death is higher than the future need for dialysis; this is the case for the elderly, in particular (2). Therefore, dialysis planning can be futile if it is to begin for every elderly patient with eGFR <30 mL/min/1.73 m².

Recent studies suggest that individuals with significant proteinuria, or an underlying primary renal disease, or with declining trajectory of renal function are more likely to need dialysis. If these issues, along with the patient’s functional status, are factored in when deciding which elderly patients with low eGFR should begin preparing for dialysis, the potential futility of the process could be reduced.

A role for maximum conservative management?

The life expectancy of patients starting dialysis therapy in the United States is about one-quarter of age- and sex-matched individuals without kidney disease, and elderly patients starting dialysis are no exception (1). The median life expectancy of dialysis patients between the ages of 75 and 79 is 2.9 years, compared with 10.8 years for individuals in the general population (3).

A recent study has focused on the dismal outcomes of frail elderly nursing home residents. An overwhelming majority of such patients experienced continued or terminal decline and death within 12 months of starting dialysis (4). Studies such as this suggest that in frail individuals with advanced CKD, starting dialysis may not necessarily improve their functional status and/or increase their life expectancy. These observations have also spurred interest in considering maximum conservative care as one of the therapeutic options for frail elderly patients with advanced CKD in lieu of preparation for dialysis, including anemia correction with erythropoietin, loop diuretics to prevent volume overload, phosphate-binders to manage itching, and potassium restriction as the only dietary intervention (5).

Choosing between maximum conservative management and renal replacement therapy requires shared decision-making that should involve the nephrologist, the patient, and the patient’s family. A time-limited trial of dialysis may facilitate decision-making for some patients. Patients who choose maximum conservative management or withdraw from dialysis after a time-limited trial may also be appropriate candidates for hospice care at some stage of their disease.

What is the optimal time to begin dialysis therapy?

In the United States, patients are starting dialysis therapy at progressively higher levels of eGFR; the higher the age, the greater the proportion of individuals who begin dialysis at an eGFR >10 mL/min/1.73 m². Conversely, dialysis may not necessarily improve their functional status and/or increase their life expectancy. These observations have also spurred interest in considering maximum conservative management as one of the therapeutic options for frail elderly patients with advanced CKD in lieu of preparation for dialysis, including anemia correction with erythropoietin, loop diuretics to prevent volume overload, phosphate-binders to manage itching, and potassium restriction as the only dietary intervention (5).

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Is one dialysis modality better than the other for elderly patients with ESRD?

The overwhelming majority of ESRD patients in the United States are treated with in-center hemodialysis; peritoneal dialysis remains the dominant home dialysis modality (1). Numerous observational studies have compared the outcomes of patients treated with in-center hemodialysis and peritoneal dialysis. These studies suggest that elderly patients treated with peritoneal dialysis, particularly those with diabetes mellitus and/or coexisting illnesses, have a somewhat shorter survival than those treated with in-center hemodialysis (2). However, over the past decade in the United States, improvements in the outcomes of peritoneal dialysis patients have outpaced those seen with in-center hemodialysis patients (3). Thus, in the most recent cohorts, the differences in survival seen in patients treated with either dialysis modality have substantially narrowed and are probably not clinical meaningful (4).

The elderly can suggest that the survival studies should have little if any bearing when assisting elderly patients and/or their families in selecting an appropriate dialysis modality. On one hand, the burden of coexisting diseases, frailty, and social isolation may make in-center hemodialysis a particularly attractive therapeutic option for many elderly ESRD patients. On the other hand, the ability to undergo dialysis at home may be perceived by some elderly patients as the best method for them to maintain their independence and dignity. Peritoneal dialysis has been successfully performed by octogenarians and nonagenarians, and this