Published in final edited form as:
Am J Kidney Dis. 2009 June ; 53(6): 925–927. doi:10.1053/j.ajkd.2009.02.013.

The Management of Elderly People With a Low eGFR: Moving Toward an Individualized Approach

Ann M. O'Hare, MA, MD
University of Washington, Primary and Specialty Medicine Service Line, VA/Puget Sound Medical Center, Nephrology and Renal Dialysis Unit, Building 100 Room 5B113, 1660 S. Columbian Way, Seattle, WA 98108. Email- ann.ohare@va.gov

In the general population, approximately 38% of adults aged 70 or older have an estimated glomerular filtration rate (eGFR) < 60 ml/min/1.73 m^2, with most having moderate reductions in eGFR in the 30-59 ml/min/1.73 m^2 range (1). Some have argued that such moderate reductions in eGFR can occur as the result of normal aging and should not be equated with chronic kidney disease (CKD) in the absence of other abnormalities (2-4). Others point out that reductions in eGFR in the elderly may reflect the high prevalence of kidney disease risk factors at older ages and should not necessarily be considered normal simply because they are common (5).

In this issue of the *American Journal of Kidney Diseases*, Roderick and colleagues take a different approach to this issue (6). Instead of asking whether older patients with moderate reductions in eGFR do or do not have CKD, they ask whether reductions in eGFR in the elderly are associated with a clinically significant outcome--mortality. These authors address this question using data collected as part of a randomized trial that compared two methods of multi-dimensional assessment in a representative sample of adults aged 75 and older drawn from primary care practices across Britain. More than half of the members of this cohort had an eGFR < 60 ml/min/1.73 m^2. Among these, most had mild to moderate decrements in eGFR (45-59 ml/min/1.73 m^2) and most were women (Figure 1). Baseline characteristics did not differ greatly between those with an eGFR 45-59 ml/min/1.73 m^2 and the referent group with an eGFR ≥ 60 ml/min/1.73 m^2, particularly among women. The prevalence of traditional complications of CKD was very low. For example, only 1% of women with an eGFR 45-59 ml/min/1.73 m^2 had hyperphosphatemia and less than 6% had a hemoglobin <11 g/dL. The prevalence of cognitive and functional impairment was by comparison much higher. For example, almost 20% of women with an eGFR 45-59 ml/min/1.73 m^2 had cognitive impairment, 33% were partially or fully dependent in two or more activities of daily living and 8% had fallen at least twice during the previous six months. However, as for many baseline characteristics, these conditions were no more common in this group than they were in women with an eGFR ≥ 60 ml/min/1.73 m^2.

Crude death rates were high for all groups but increased with falling eGFR from 8% among those with an eGFR ≥ 60 ml/min/1.73 m^2, to 21% among those with an eGFR < 30 ml/min/1.73 m^2. Mortality rates were consistently higher and increased more steeply across eGFR categories among men compared with women. Compared with the referent group, absolute

Financial[ND1] Disclosure: None.

mortality rates for those with an eGFR 45-59 ml/min/1.73 m^2 were approximately 1% per year higher for women and 3% per year higher for men. After adjustment for baseline characteristics, the risk for all-cause mortality relative to the referent category with an eGFR ≥ 60 ml/min/1.73 m^2 was only minimally elevated for those with an eGFR 45-59 ml/min/1.73 m^2, and this did not reach statistical significance for women. Nevertheless, for both men and women in this group, death was more likely to be due to cardiovascular causes than for patients with higher levels of eGFR, particularly if this occurred within the first two years of follow-up. The presence of dipstick proteinuria did not contribute substantial additional prognostic information beyond that provided by eGFR. Roderick and colleagues conclude that in the elderly, identification and management of CKD should focus on the select group with more severe reductions in eGFR.

Unlike many studies examining the relationship between eGFR and mortality in the elderly, members of the cohort described by Roderick and colleagues underwent detailed baseline assessment for both clinical and functional status measures and are thus extraordinarily well characterized. Furthermore, while clinical trial populations are often poorly representative of the general population, this study population was deliberately selected so as to be representative of older adults in general practice. Nevertheless, some caution is warranted in interpreting the results of this study. While mortality is clearly an important and reliably ascertained outcome, other clinical outcomes may be more important in the elderly, including hospitalization, non-fatal cardiovascular events, disability, reduced quality of life, cognitive decline and loss of independence. In addition, because ascertainment of proteinuria was based only on the results of dipstick, this study may underestimate the prognostic value of urine protein measurements in this cohort. Finally, as the authors point out, heterogeneity in mortality rates among those with an eGFR ≥ 60 ml/min/1.73 m^2 render estimates of relative risk sensitive to the referent category selected.

Notwithstanding these limitations, the findings reported here are very consistent with the results of earlier studies conducted in more broadly defined cohorts demonstrating that the relative risk of death associated with a given level of eGFR is attenuated in the elderly (7-10). The significance of this finding is that in the elderly, the threshold level of eGFR below which mortality risk exceeds that in the referent category is lower than in younger patients ((9,10). Collectively, these studies raise the question of whether a disease-oriented approach is appropriate for many elderly individuals who meet criteria for CKD. For patients with moderate reductions in eGFR, the National Kidney Foundation's Kidney Disease Outcomes Quality Initiative (KDOQI) clinical action plan recommends the following strategies: diagnosis and treatment of kidney disease, treatment of comorbid conditions, slowing progression, cardiovascular risk reduction, estimating progression and evaluating and treating complications (11). However, the value of this approach in older adults with mild to moderate reductions in eGFR is uncertain if most are at no higher risk of death than their age peers with higher levels of eGFR, do not have a treatable complication of CKD and have a less than one percent per year chance of progressing to end-stage renal disease (as demonstrated in prior studies) (12,13).

Tinetti and Fried have pointed out that disease-oriented models of care evolved in an era when life was short and life expectancy was impacted by dominant disease processes (14). They argue that the management of complex comorbidity in the elderly calls for a more individualized approach to care focused on attainment of patient goals and on impacting modifiable processes—both biologic and non-biologic (14). Table 1 highlights the differences between these two models of care. It is important to note that an individualized approach does not preclude the application of disease-specific treatment strategies when these may impact outcomes of importance to the individual patient.

Under the individualized care model, knowing whether or not an elderly person with moderate reductions in eGFR has CKD assumes less importance than it might under a disease-oriented model. Instead, greater emphasis is placed on assessing each patient's risk for particular outcomes, eliciting which outcomes are most important to the patient and identifying processes that can be modified. Thus, for example, kidney disease-specific strategies may be very appropriate for an elderly person with an eGFR of 55 ml/min/1.73 m^2 who has evidence for progressive loss of kidney function and/or metabolic complications of CKD, particularly if there are no competing health concerns. Conversely, in an elderly person with a stable eGFR of 55 ml/min/1.73 m^2 and no complications of CKD, other health concerns may reasonably take precedence.

In conclusion, an individualized model may be more appropriate than a disease-oriented model of care for many elderly people who meet criteria for CKD. The substantial prognostic significance of eGFR in the elderly suggests that it may be very helpful in crafting individualized treatment plans. The clinical utility of this measure could be further enhanced by more studies like this one. Studies that embrace the complexity of how eGFR relates to significant outcomes in older adults in relation to potential modifying factors. The better we understand what eGFR and urinary protein can tell us about what lies in store for our elderly patients, the more helpful these measures will be in the clinical setting.

Ann M. O'Hare, MA, MD

University of Washington, VA/Puget Sound Medical Center

Seattle, Washington

References

1. Coresh J, Selvin E, Stevens LA, et al. Prevalence of chronic kidney disease in the United States. Jama 2007;298(17):2038–47. [PubMed: 17986697]
2. Glassock RJ, Winearls C. An epidemic of chronic kidney disease: fact or fiction? Nephrol Dial Transplant 2008;23(4):1117–21. [PubMed: 18359870]
3. Glassock RJ, Winearls C. Screening for CKD with eGFR: Doubts and Dangers. Clin J Am Soc Nephrol. 2008
4. Poggio ED, Rule AD. A critical evaluation of chronic kidney disease--should isolated reduced estimated glomerular filtration rate be considered a ‘disease’? Nephrol Dial Transplant. 2008
5. Stevens LA, Coresh J, Levey AS. CKD in the elderly--old questions and new challenges: World Kidney Day 2008. Am J Kidney Dis 2008;51(3):353–7. [PubMed: 18295048]
6. Roderick P, Atkins RJ, Smeeth L, et al. Chronic Kidney Disease and Mortality Risk in Older People: a community-based population study in the United Kingdom. American Journal of Kidney Diseases 2009;53:•••–•••.
7. Drey N, Roderick P, Mullee M, Rogerson M. A population-based study of the incidence and outcomes of diagnosed chronic kidney disease. Am J Kidney Dis 2003;42(4):677–84. [PubMed: 14520617]
8. John R, Webb M, Young A, Stevens PE. Unreferred chronic kidney disease: a longitudinal study. Am J Kidney Dis 2004;43(5):825–35. [PubMed: 15112173]
9. O'Hare AM, Bertenthal D, Covinsky KE, et al. Mortality risk stratification in chronic kidney disease: one size for all ages? J Am Soc Nephrol 2006;17(3):846–53. [PubMed: 16452492]
10. Raymond NT, Zehnder D, Smith SC, Stinson JA, Lehnert H, Higgins RM. Elevated relative mortality risk with mild-to-moderate chronic kidney disease decreases with age. Nephrol Dial Transplant. 2007
11. National Kidney Foundation. K/DOQI clinical practice guidelines for chronic kidney disease: evaluation, classification, and stratification. Am J Kidney Dis 2002;39(2 Suppl 1):S1–266. [PubMed: 11904577]
12. Eriksen BO, Ingebretsen OC. The progression of chronic kidney disease: a 10-year population-based study of the effects of gender and age. Kidney Int 2006;69(2):375–82. [PubMed: 16408129]

13. O'Hare AM, Choi AI, Bertenthal D, et al. Age affects outcomes in chronic kidney disease. J Am Soc Nephrol 2007;18(10):2758–65. [PubMed: 17855638]

14. Tinetti ME, Fried T. The end of the disease era. Am J Med 2004;116(3):179–85. [PubMed: 14749162]

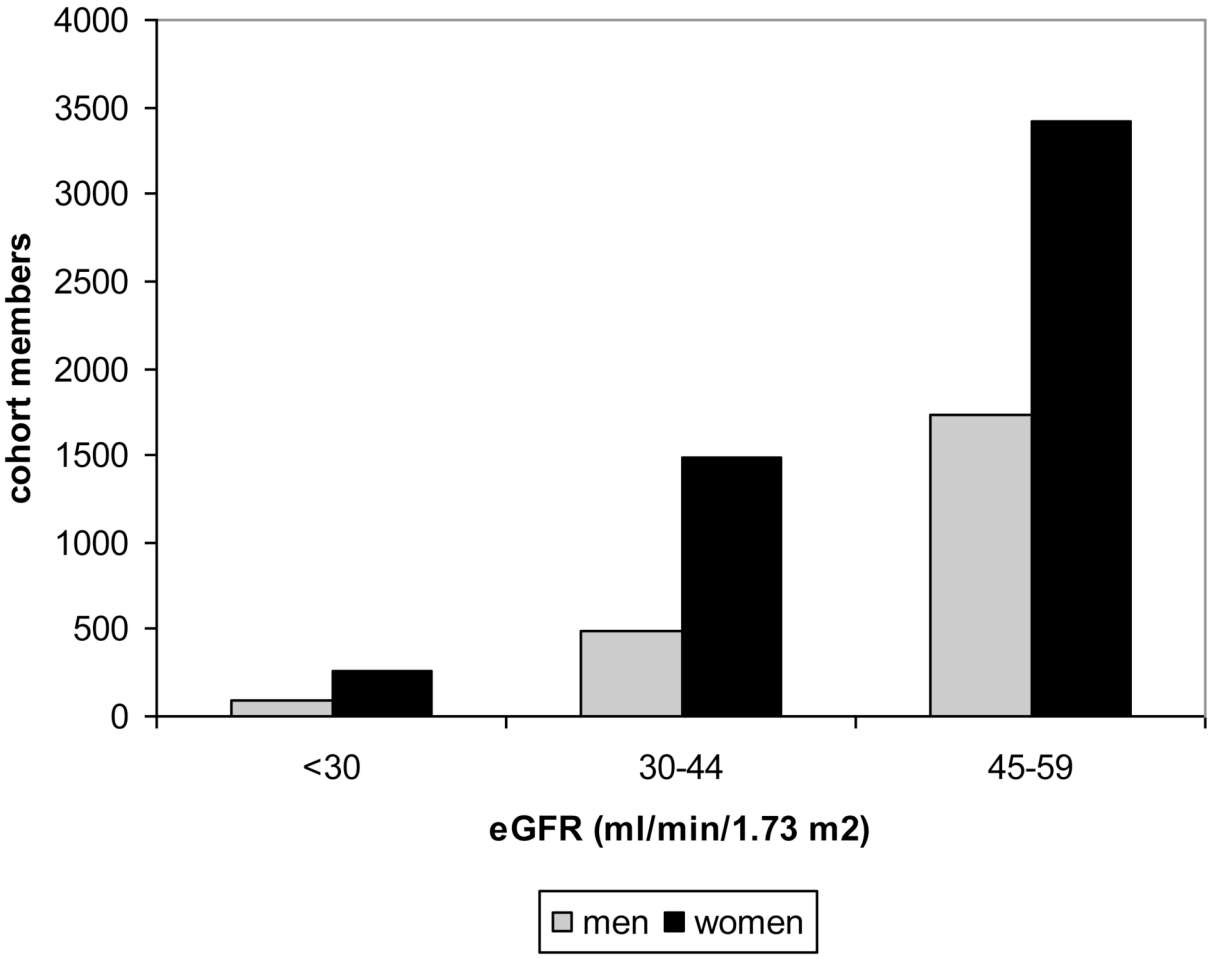

Figure 1.
Distribution of estimated glomerular filtration rate (eGFR) among men and women cohort members with an eGFR <60 ml/min/1.73 m^2. Conversion factor for GFR in mL/min/1.73m2 to mL/s/1.73m2, ×0.01667. Data source: Roderick et al (6).

Table 1

Comparison of disease-oriented and integrated models of care

Disease oriented model	Integrated, individually tailored model
Clinical decision making is focused primarily on the diagnosis, prevention, and treatment of individual diseases.	Clinical decision making is focused primarily on the priorities and preferences of individual patients.
Discrete pathology is believed to cause disease; psychological, social, cultural, environmental and other factors are secondary factors, not primary determinants of disease.	Health conditions are believed to result from the complex interplay of genetic, environmental, psychological, social, and other factors.
Treatment is targeted at the pathophysiologic mechanisms thought to cause the disease(s).	Treatment is targeted at the modifiable factors contributing to the health conditions impeding the patient's health goals.
Symptoms and impairments are best addressed by diagnosing and treating “causative” disease(s).	Symptoms and impairments are the primary foci of treatment even if they cannot be ascribed to a discrete disease.
Relevant clinical outcomes are determined by the disease(s).	Relevant clinical outcomes are determined by individual patient preference.
Survival is the usual primary focus of disease prevention and treatment.	Survival is one of several competing goals.

Reproduced with permission from Tinetti and Fried (14).