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National Kidney Foundation's Kidney Early Evaluation Program (KEEP) Annual Data Report 2010: Executive Summary

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This year, 2011, the National Kidney Foundation's (NKF) Kidney Early Evaluation Program (KEEP) marks more than a decade of data collection as part of its multicenter screening program for volunteer participants at risk of chronic kidney disease (CKD).[1] Over the years, KEEP data have yielded important inferences regarding the epidemiology of obesity, hypertension, diabetes, CKD, cardiovascular disease, and related comorbid conditions, including bone and mineral disorders and anemia.[2,3] This supplement to the *American Journal of Kidney Diseases* highlights 4 articles pertaining to the 2010 KEEP Annual Data Report: (1) a description of key methods used in KEEP that have led to sustainability,[4] (2) a comparison of 2 methods for deriving estimated glomerular filtration rate (eGFR) and how they categorize associated CKD risk factors,[5] (3) a comparison of eGFR equations and levels of participant disease awareness,[6] and (4) a detailed report considering risk-factor clustering in KEEP participants with diabetes mellitus.[7]

SUSTAINABILITY

KEEP has evolved as the world's only continual chronic disease screening program that is free of charge to volunteer participants with hypertension, diabetes, or a family history of these conditions or of CKD. Commitment by the NKF and its affiliates and by individual, community, and scientific stakeholders with a common belief in the value of KEEP efforts have made this program sustainable.[4]

The KEEP Publications Committee now allows open access to the KEEP database for researchers across the country. With the oversight of the KEEP Steering Committee, individual investigators have begun creative and important epidemiologic analyses of KEEP data. We believe the growth of KEEP as a scientific enterprise will be critical to its long-term success.

Expansion of KEEP methods outside the United States has continued. Validation of successful methods, new insights into country and cultural differences, and the ability to perform global analyses of chronic disease epidemics, such as obesity, diabetes, and CKD, have made the international KEEP program a high priority for the Steering Committee. Future challenges include data integration and collective efforts to change global public health policy as it relates to CKD and its risk factors.

ESTIMATING GFR

For this issue of the KEEP Annual Data Report, the CKD Epidemiology Collaboration (CKD-EPI) equation was used alongside the Modification of Diet in Renal Disease (MDRD) Study equation; next year's Annual Data Report will use the CKD-EPI equation exclusively.[8,9] Stevens et al[5] compared mortality risk predictions and characteristics of participants whose CKD status was and was not reclassified using the CKD-EPI equation. The prevalence of $eGFR_{CKD\text{-}EPI}$ <60 mL/min/1.73 m^2 was 14.3% compared with 16.8% for $eGFR_{MDRD}$ <60 mL/min/1.73m^2 (Fig 1). Using $eGFR_{CKD\text{-}EPI}$, 20,355 participants (17.5%) were reclassified to higher and 3,107 (2.7%) were reclassified to lower eGFR categories. Thus, the immediate implications are that fewer people will be classified as having CKD using $eGFR_{CKD\text{-}EPI}$. Participants who were reclassified upward were younger and less likely to have chronic conditions, with lower risk of mortality, suggesting that this approach is more accurate and more appropriate for raising awareness and for clinical management.

AWARENESS OF CKD

Low awareness of CKD may reflect uncertainty about the accuracy or significance of a CKD diagnosis

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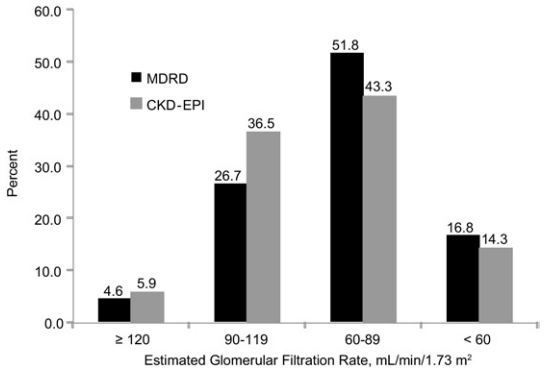

Figure 1. Prevalence of glomerular filtration rate categories estimated using the Modification of Diet in Renal Disease (MDRD) Study and Chronic Kidney Disease Epidemiology Collaboration (CKD-EPI) equations in KEEP (Kidney Early Evaluation Program).

based on eGFR in individuals otherwise perceived to be healthy. Whether reclassification of CKD severity using the CKD-EPI equation could influence rates of awareness was the topic of the contribution by Kurella Tamura et al.[6] KEEP data collected from 2000-2009 showed that of 26,213 participants identified as having CKD based on $eGFR_{MDRD}$, 23,572 (90%) also were classified with CKD based on $eGFR_{CKD\text{-}EPI}$. Reclassification to less or more advanced stages of CKD had concordant effects on rates of awareness with no great detriment in moving to the newer $eGFR_{CKD\text{-}EPI}$ equation.

DIABETES AND RISK FACTORS

Diabetes mellitus is the major determinant of CKD nationwide, accounting for 44.6% of incident end-stage renal disease. Patients with CKD, in a bidirectional manner, also are at high risk of developing diabetes, with considerable overlap of the 2 concurrent established conditions. McFarlane et al[7] report a cross-sectional analysis of KEEP data collected between August 2000 and December 2009. Of 109,055 participants with a mean age of ~55.3 years, 68.2% were women and 31.8% were African American. Risk factors for diabetes in participants were prevalent, including obesity in 45% and family history of diabetes in 59%. In multivariate analysis, the risk of having diabetes increased significantly with each stage of CKD based on $eGFR_{MDRD}$ or $eGFR_{CKD\text{-}EPI}$. Thus, this analysis clearly shows bidirectionality of risk, or the common soil for the development of both diabetes and CKD in a population at risk.

SUMMARY

The NKF KEEP is the world's only sustainable chronic disease screening program. Its success is attributable in part to the continued dedication and commitment of stakeholders (NKF, local affiliates, and academic community), but also to a unique set of methods that balance detail with simplicity and place efficiency at a premium. The CKD-EPI equation appears to be an incremental refinement in the screening of large populations for CKD. It works to classify fewer participants with CKD based on the eGFR cutoff of 60 mL/min/1.7 $3m^2$; however, appropriately, participants who are classified with CKD appear to be at higher risk of morbidity and mortality. Using this equation appears to have little impact on what is at present a low awareness of CKD in those who are discovered to have it. Finally, because diabetes and CKD share mutual risk factors, screening for both diabetes and CKD makes considerable sense in large chronic disease screening programs outside KEEP. We look forward to future advancements in KEEP and anticipate that its efforts will continue to shape what we know about common chronic diseases in the hopes of preventing their further spread.

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