Primary Care of the Patient with Chronic Kidney Disease

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KEYWORDS

• Chronic kidney disease • Chronic disease management • Primary care • Proteinuria • Albuminuria

KEY POINTS

- Patients with chronic kidney disease (CKD) are more likely to die of cardiovascular (CV) disease than progressing to end-stage renal disease (ESRD).
- Prevention, early detection, and proper treatment of CKD helps reduce the risk of CKD complications and progression to ESRD.
- Persistent albuminuria or proteinuria should always be evaluated and is an independent marker for disease progression and mortality.
- Angiotensin blockade is a cornerstone of therapy for CKD.
- Kidney specialist referral should be initiated for all patients with rapidly progressing CKD, with stage 4 CKD, or with uncertain etiology.

Case

Jack Francis, a 52-year-old gentleman of European descent, is scheduled to see you for follow-up of an emergency department visit. You skim his chart before walking in the room and see his emergency visit was for left toe pain, ultimately leading to a diagnosis of gout. Further chart review reveals no past medical history other than mild knee osteoarthritis, overweight (body mass index of 27 kg/m^2), and borderline high blood pressure (BP). He takes no prescribed medications. Laboratory results drawn at the emergency visit reveal a serum creatinine level of 1.8 mg/dL. Looking through his chart, the only other creatinine value in the records is 1.5 mg/dL 2 years ago.

How do you approach this creatinine value in this patient?

Conflicts of interest: nothing to disclose.

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BACKGROUND

While it is tempting for the busy clinician to overlook the modestly elevated creatinine level in this individual, particularly given his more acute and symptomatic complaint, further evaluation is critical. In the primary care setting, it can be challenging to recognize CKD as a distinct entity from its co-occuring conditions; in most studies, less than half of patients with CKD have it documented in their medical record.[1] International guidelines define CKD as at least 3 months of either reduced glomerular filtration rate (GFR<60 mL/min/1.73 m^2) or evidence of kidney damage.[2] Current recommendations classify kidney disease based on the underlying cause,[1] GFR category,[2] and albuminuria category.[3] Each of these is important for predicting the risk of complications from CKD.

Kidney disease severity is divided into 5 stages, based on the estimated GFR; CKD is defined as kidney damage or GFR less than 60 mL/min/1.73 m^2 for 3 months or more, irrespective of the cause (**Box 1**, **Fig. 1**). The 2012 guidelines have been updated to emphasize the importance of albuminuria, dividing it into 3 stages, with stages 2 to 3 definitive for CKD. ESRD, or kidney failure, is generally defined by dependence on renal replacement therapy (RRT) or transplant.

Mr Francis' GFR can be quickly calculated using Modification of Diet in Renal Disease (MDRD) and Chronic Kidney Disease Epidemiology Collaboration (CKD-EPI) tools available online (such as at nephromatic.com); it is 42 mL/min/1.73 m^2, placing him in CKD category G3b.

EPIDEMIOLOGY

CKD affects approximately 13.6% of all US adults, making it more common than diabetes.[3] The prevalence increases with age; among adults aged 60 to 69 years, nearly 25% have either albuminuria or reduction in GFR, and among adults older than 70 years, nearly 50% do.[4] Some decline in GFR is expected with age and may reflect normal aging processes, potentially leading to some overdiagnosis of CKD in the elderly; however, advanced CKD and ESRD rates are also higher in this group.[5] Among persons with hypertension, the prevalence of CKD is approximately 20%, and one-third of adults with diabetes have CKD.[6] Among adults who develop ESRD, the vast majority of cases (>70%) are thought to be due to either hypertension or diabetes.[6]

CKD is also more common among African-American and Latino individuals.[3] Women have higher rates of overall CKD, but ESRD is more common among men.[6] Other risk factors for CKD include obesity, CV disease, a family history of renal disease, or a history of acute kidney injury (AKI).[3]

Despite overall improvement in the management of CKD risk factors such as hypertension, smoking, and diabetes, the proportion of Americans with CKD has been

Box 1
CKD definitions

- CKD is defined by 3 months or more of reduced GFR (<60 mL/min/1.73 m^2) or evidence of kidney damage (such as albuminuria, abnormal pathology, imaging, or urine sediment)
- Albuminuria is defined by a urine albumin-to-creatinine ratio of 30 mg/g or more (or ≥30 mg/mmol)
- Each of these (reduced GFR and albuminuria) can be broken down into further categories, with more dysfunction corresponding to higher risks of CKD progression and complications