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Opinion on Primary and Secondary Prevention of Chronic Kidney Disease

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Introduction

Chronic kidney disease (CKD) is one of the most prevalent progressive chronic illnesses that plague all ethnicities, especially those of minority descent. CKD is the ninth leading cause of death in the United States and have been defined as damage to the kidneys or a decline in the glomerular filtration rate (GFR) below 60 mL/min/1.73 m² for the duration of three or more months [1]. CKD can occur from a variety of underlying etiologies that diminish the availability of functional nephrons, and results in a cascade of irreparable sclerosis of residual nephrons, which facilitates the advancement of the disease process [2]. These underlying etiologies of CKD include: diabetic nephropathy, hypertension, glomerulonephritides, interstitial nephritis, pyelonephritis, polycystic kidney disease, obstructive nephropathy, untreated acute kidney injury (AKI) caused by infections, medicines, toxic substances heavy metals including lead, cadmium, mercury and chromium [2]. Risk factors for developing CKD include: diabetes, hypertension, a family history of CKD, obesity, age 60 years or older, smoking, and being a minority.

The National Chronic Kidney Disease Fact Sheet reports that there are approximately 30 million adults in the United States (U.S.) with CKD of which African Americans, Hispanics, Pacific Islanders, American Indians, and seniors are at increased risk [3]. Further reports indicate African Americans are at a ratio of 3:1 increased risk for renal failure in comparison to Caucasian Americans, and Hispanics are 35% more at risk to develop kidney failure in comparison to non-Hispanics [3]. Devastating statistics as of 2013, according to the National Kidney Foundation (NKF) [4] relative to individuals diagnosed with new end stage renal disease (ESRD) include: Caucasians (67.7%), African Americans (26%), Hispanic or Latino (14.7%), Native American (0.9%), Asian Americans (4.9%), and other Americans (0.29%). Furthermore, there are an overwhelming number of individuals placed on dialysis and include: Caucasians (269,515), African Americans (164,575), Hispanic or Latino (83,691), Native American (5,438), Asian Americans (25,743), and other Americans (1,336). Based on the population of other ethnicities represented, it is clear that because of the decreased number within their population, the minority ethnicities are at greater risk and often receive a disproportional opportunity to benefit from a functioning

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kidney transplant as noted: Caucasians 137,862 (51.2%), African Americans 38,268 (23.3%), Hispanic or Latino 27,931 (33.4%), Native American 1,750 (32.2%), Asian Americans 11,139 (43.3%), and other Americans 4,243 (317.5%). Consequently, those individuals that are placed on dialysis have notable complications that affect the heart and other organs, resulting in increased morbidity and mortality rates.

Morbidity and Mortality Rates of CKD

CKD affects individuals worldwide, contributes to the financial hardship of managing chronic illnesses, and is an autonomous threat for numerous and diverse disparaging consequences including cardiovascular disease (CVD). The potential risks associated with CVD can be termed as traditional (smoking, hypertension, dyslipidemia and diabetes) or non-traditional risk factors (uremia-specific and consist of the escape of enormous levels of inflammatory and prothrombotic factors, low levels of hemoglobin, albuminuria, and abnormal bone and mineral metabolism [5]. Researchers have estimated that 50% of individuals diagnosed with ESRD will improbably not out live a CVD event; in comparison to the overall society. The age adjusted CVD mortality rate is estimated to be 15 to 30 times greater.

An estimated one million deaths globally are stemmed from CKD, and is directly related to one out of 57 terminal events. CKD

mortality rates increased from 1990 to 2013 by 134%. Because of the relationship between CKD and diseases that affect the heart and blood vessels, approximately 7% of CVD deaths results from decreased glomerular-filtration rates. "Two large cohort studies reported markedly decreased life expectancies for patients with CKD stage 3B (a 17-year shorter survival) and CKD stage 4 (a 25-year shorter survival) compared with subjects with normal kidney function" [6]. Other significant findings note a compelling influence on non-terminal consequences and morbidity rates. According to the Global Burden of Disease Study (GBD) among an estimated 300 underlying reasons for disabilities, CKD was ranked as 15th leading cause of years lived with a disability and 20th leading cause of the disability-adjusted life years, and disability-adjusted life years [7].

Based on reliable epidemiological studies in various locations globally, an estimated 10-13% of the general adult population possesses indicators of CKD. Consequently, suggesting an escalation in the number of individuals affected by CKD as a result of several causes, which includes the increasing geriatric population and the rising incidence of diabetes.

Asymptomatic Screening

Currently, the U.S. Preventive Services Task Force (USPSTF) provides no recommendations for generalized laboratory screenings for asymptomatic individuals. "The USPSTF could not determine the balance between the benefits and harms of screening for CKD" [8], and concluded that there were insufficient evidence for screening the general adult population in asymptomatic adults. It was the consensus of the American College of Physicians (ACP) that there was no benefit in providing laboratory screenings among the asymptomatic population at-large, since there were limited Randomized Control Trials (RCT) [9]. There has been emphasis on providing laboratory screenings for asymptomatic individuals among those with posing risk factors. According to the American Society of Nephrology there is intense support for asymptomatic screening of CKD whether or not risk factors are present. The organization focus is directed towards the opportunity to prevent and/or stifle the progression of CKD by conducting basic economical diagnostic tests. Other professional entities including the NKF, the Renal Physicians Association, and The American Diabetes Association (ADA) validate the need to provide CKD screening to those individuals classified as at-risk. The CKD guidelines established by the Kidney Disease Improving Global Outcomes (KDIGO) failed to acknowledge screening for CKD (5). However, the NKF Kidney Disease Outcome Quality Initiative Commentary Work Group (20) approved the endorsement from a previous guideline (21) suggesting the need to conduct assessments and screenings on persons deemed to be at high risk for CKD. According to Sherwood and McCullough [10], Ene-lordache and colleagues, as well as, the U.S. Kidney Early Evaluation Program (KEEP) propose that those individuals with diabetes, hypertension, smoking, and/or family history of CKD are evidenced high-yield criteria to receive screening and measurement of eGFR and urine albumin.

Conclusion

It is imperative that implementing primary and secondary prevention strategies for at risk groups is the responsibility of

all healthcare providers, especially among primary care and community based arenas. Primary prevention for CKD addresses patient education, and the promotion of healthy lifestyles to reduce the potential threat of developing CKD. Secondary prevention strategies target conducting risk assessments, and providing appropriate cost-effective screenings to those individuals deemed to be at-risk. Implementing primary and secondary prevention strategies is in congruent with health promotion aimed at education, lifestyle modifications, and early detection of CKD.

Nurse practitioners and nurse educators play a vital role in implementing these prevention strategies and target their efforts to reduce unfavorable outcomes associated with CKD. According to Walton [11] "NPs, PAs and other primary care providers are valuable resources for improving overall quality of life in high-risk patients by educating them about the importance of annual screening and self-management". Consequently, creating awareness among primary health care providers to identify those at risk for CKD including obese patients, smokers, those with family members diagnosed with CKD, and of minority ethnicities, which are often overlooked. Early detection will yield early intervention to deter the progression of CKD. Although individuals will not be referred to a nephrologist until diagnosed with Stage 3b CKD (moderate reduction in GFR 30-44 ml/min/1.73 m²), other interventions could contribute to the postponement of CKD if detected earlier in the cascade of the disease process.

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