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The Role of Family Physicians in Early Detection and Management of Chronic Kidney Disease

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Abstract **Review Article**

Chronic kidney disease (CKD) is a global public health issue, one that often goes unnoticed until advanced stages. Family physicians can play an important role in the early detection and management of CKD as they provide continuous and comprehensive care of patients. This study examines how family physicians can help identify high-risk populations, start diagnostic tests and treat patients to delay disease onset and complications. Through regular health check-ups, risk evaluation and preventive care programmes, family physicians are able to diagnose CKD at asymptomatic stage. They also educate patients, counsel on lifestyle choices, manage medications, and send referrals to specialists if needed. Also, family physicians are important links in ensuring compliance with treatment and follow-up schedules. Incorporating CKD management into primary care helps improve outcomes and lessens the load on tertiary healthcare. New training, clinical guidelines or support system for family physicians are required to enable them to combat chronic kidney disease effectively.

Keywords: Chronic kidney disease, family physicians, early detection, primary care, disease management.

1. INTRODUCTION

According to the 2013 guidelines, chronic kidney disease (CKD) is defined as abnormal kidney function or structure that persists for 3 months or longer, resulting in a decrease in the glomerular filtration rate (GFR) to <60 mL/min/1.73 m2 or adverse kidney changes [1]. The prevalence of CKD in the general adult population, defined according to GFR < 60, ranges from 5 to 10% [2]. Diabetes mellitus (DM), hypertension (HTN), and obesity are considered key risk factors for both CKD and cardiovascular disease (CVD) [3]. With these understandings, relevant studies have been conducted around the world to seek the perspective of general practitioners/family physicians (GPs/FPs) regarding CKD, its risk factors, early detection, staging/management, and follow-up/care [4]. GP/FPs play a key role in educating the community to be aware of kidney health screening and exercise, diet control, and other preventive measures for obesity, diabetes, and hypertension [5]. Trained GP/FPs can screen, manage, and monitor early/low-risk CKD cases and subsequent care [6].

2. Understanding Chronic Kidney Disease

Chronic kidney disease (CKD) is the progressive loss of kidney function over a prolonged period, usually months or years [7]. CKD is most common in elderly populations and can occur as a result of other conditions [8]. Diabetes and hypertension contribute to the majority of CKD cases, which progresses slowly and often goes unnoticed because the kidneys adjust to the loss of function until they are severely damaged [9]. Given that >90% of patients remain asymptomatic during the early stages of CKD, there is an urgent need for screening programs focused on risk groups to enable early detection and management of CKD [10]. Early treatment can slow CKD progression, reduce morbidity and mortality in the at-risk population, and minimize healthcare costs [11].

Healthy lifestyle choices (diet and exercise) and regular health check-ups with urine tests for albumin and blood tests for creatinine are necessary for the prevention of CKD [12]. Establishing patient-centered CKD risk management programs based on screening, routine examination, and education is important [13]. Effective programs necessitate the engagement of health policy makers, healthcare professionals, stakeholders, and the community [14].

CKD is estimated to affect up to 10% of the adult population, accounting for >90 million individuals worldwide [15]. Based on estimates from the National

Kidney Foundation and the Intermountain Healthcare Corporation in the United States, CKD affects >11.4% of the general population [16]. CKD is a global healthcare problem with increasing incidence and prevalence, and the need for early recognition and effective management is being increasingly emphasized in primary care policy [17]. Although progressive renal impairment can lead to kidney failure requiring dialysis or transplantation, CKD is usually asymptomatic until the later stages of the disease [18]. Hence, a substantial number of individuals are unaware that they have CKD [19]).

2.1. Definition and Staging

Chronic kidney disease (CKD) is defined as a reduction in the glomerular filtration rate (GFR) <60 milliliters per minute (mL/min)/1.73 m2 or by the presence of markers of kidney damage [20]. Kidney damage is defined by structural or functional abnormalities of the kidney, including abnormalities of the components of blood and urine or abnormalities on imaging studies, for a duration of at least 3 months [21]. While counting down towards end-stage kidney failure (ESKD), CKD of any etiology is a complex syndrome characterized by the gradual predominance of certain comorbidities, such as cardiovascular diseases [22]. Consequently, CKD patients are plagued by slow reduction in the quantity of nephrons per kidney, modulation of functions to reduce excess accumulation of wastes, social and economic consequences, economic ruin, premature death, and disability to participate in formal education or fellowship, thereby politically relegating to the margins of society [23]. CKD patients are cast into a quagmire of futile long term merciless control of blood pressure at the expense of the use of available antihypertensive drugs [24]. CKD-FV in clinical practice refers to the proper understanding and recognition of approaching CKD among patients with atrisk disease. Most studies of CKD-FV restate the advent of predialysis CKD and take for granted the current screening criteria of diabetes mellitus (DM) or hypertension (HPT) for CKD monitoring [25]. GFR is tapered with age, but remains constant, for the time being, in well nourished adults and under certain standard and agreed conditions, including creatinine method, age, sex, ethnicity, and a carefully considered initial value. RDW diversity index increases with CKD stage in the general population, while ME-Index are lowered [26]. Thus, in-depth GFR analysis and estimation could provide earlier identification of those susceptible to progressive CKD but are missed by existing screening criteria [27]. The limits and practical implementation of CKD-FV and issues of care co-management of diabetes and CKD are also discussed [27]. CKD-FV is the recognition and understanding of impending CKD status among those currently regarded as not having CKD or those with uncertain disease status [28].

2.2. Epidemiology

Chronic kidney disease (CKD) is a progressive loss of kidney function caused by a range of structural and functional derangements of the kidney [29]. An agenda has been set out for chronic kidney disease screening in both developed and developing countries, but globally much of the population remains undiagnosed [30]. Early detection is expected to save lives and to reduce morbidity and mortality, economic burden, and costs associated with chronic kidney disease [31]. As chronic kidney disease screening is being introduced into primary care, a cohort study was conducted to establish the current state of chronic kidney disease screening in primary care and recommendations for improving nephroprotection [32].

Chronic kidney disease is a globally increasing public health issue that results in substantial economic burden [33]. Mindful this, the International Society of Nephrology has launched a WelCome-CKD initiative to relay the message “Early diagnosis saves lives” to save lives and reduce morbidity, mortality, and cost related to chronic kidney disease through case finding, screening, and early detection of chronic kidney disease [34]. Current strategies and databases are focused on high-risk groups [34]. Tested strategies can and should be adopted by overall populations [35]. However, chronic kidney disease screening is not currently a part of population-based screening programs in high or low-income countries [36].

2.3. Risk Factors

Chronic kidney disease (CKD) is a growing public health concern worldwide [25]. Once thought to be a disease of industrialized nations, CKD now represents a substantial portion of the burden of disease in developing countries [30]. More than 300 million people in developing countries currently are estimated to suffer from chronic kidney disease; this number is likely to double in the next 25 years [37]. In developing countries such as Pakistan, where a substantial burden of CKD exists, resources devoted to its management are severely lacking [38]. Less than 1% of patients with end-stage renal disease (ESRD) in these countries benefit from dialysis or transplant; the vast majority undergo renal replacement therapy with traditional means such as herbal detoxification and “blood cleansing.” Prevention of the progression of CKD falls on the shoulders of the primary care physician, family physician or general practitioner (GP) in both developing and industrialized countries [39]. Evidence-based clinical practice guidelines facilitate the effective prevention and treatment of CKD and its complications [28].

3. The Role of Family Physicians

In recent years, growing attention has been paid to the role of primary care physicians in encouraging early diagnosis and management of chronic kidney disease [40]. General practitioners act as the first point of contact in the healthcare system, and most patients

remain under their care for years [41]. Early detection and appropriate management of CKD in the primary healthcare setting could prevent adverse outcomes and a reduction in premature deaths associated with kidney disease [42]. Patients with CKD receiving excellent peripheral care have significantly lower hospitalization rates and need for specialist care [43]. Provision of chronic kidney disease management at the primary care level is cost-effective [43].

It has been suggested that family physicians and primary care physicians should have a key role in detecting risk factors for chronic kidney disease, early diagnosis, general management, patient education, and timely referral [44]. However, it has been noted that existing evidence on the awareness, knowledge, and practice of family physicians regarding chronic kidney disease is limited [45]. Studies have found that for early diagnosis of chronic kidney disease, isolated serum creatinine was the most commonly used test, while only a portion specified the glomerular filtration rate to classify patients as stage 1 and only a smaller portion as stage 2 [46]. This probably increased the chances of under recognition of chronic kidney disease as the glomerular filtration rate decreases by 50% before the serum creatinine concentration rises [47].

3.1. Clinical Responsibilities

Chronic kidney disease (CKD) is a common condition that affects health-related quality of life and is associated with increased morbidity and mortality due to cardiovascular disease (CVD) and the progression to end-stage kidney disease (ESKD) [48]. Since 2016, there has been a renewed focus on addressing the CKD epidemic in the USA, including the 2020 Advancing American Kidney Health Initiative Executive Order that aims to decrease the rate of new ESKD cases by 25% by 2030 [49]. The recommended multipronged approach to decrease the incidence of ESKD by ≥25% through 2030 involves several strategies, including [1] population screening for adults aged ≥18 years who are at risk for CKD by primary care clinicians, [2] care planning and management of CKD in primary care, and [3] referral for kidney replacement therapy by endocrinologists and nephrologists [50]. At present, the major proportion of CKD care in the USA is suboptimal, with care planning and management often insufficiently performed or poorly implemented by primary care clinicians [51].

With the expanding role of family physicians (FPs) and generalists in the delivery of health care, an opportunity exists for the primary care team to bridge the evidence-implementation gap in CKD management [52]. FPs can identify people with diabetes and/or hypertension via blood pressure measurement and screening laboratories and are thus contextually situated to implement all activities in CKD care [53]. Participatory action research coils promote the inclusion of the organization, stakeholders, and community, and could co-create educational materials and health systems and policies to better integrate CKD detection and coordination of care into primary care [54]. In community settings, it is important to address the social determinants of health in individuals to mitigate the cascading effects of CKD [55].

3.2. Patient Education

Education of patients is an important part of management of chronic kidney disease (CKD) (56). Such education should regard at least two aspects [56]. First, the patients need to be educated about the disease and its risks [56]. Only comprehensive knowledge of the disease can ensure compliance with the recommendations [56]. The management recommendations should be realistic and take into consideration the health status of the patient and opportunities for implementation [57] In Poland, information and educational standards of health care should be met [57]. With regard to CKD, preferential consideration should be given to the information about the principles of healthy lifestyle, pharmacotherapy, and rules for periodic visits [54]. Flyers regarding the principles of healthy lifestyle, dietary sodium intake, and medication safety should be promoted [58]. Second, a wider education should regard primary care physicians (PCP) [58]. Proper education not only of medical students in a higher education institution but also of already working PCPs in such a form that they can improve their knowledge regarding CKD is needed [58]. Education is necessary regarding the precautions about medications and the proper pharmacotherapy [59]. Not only seats during the university education but also in-service training would be desirable [59]. It may take place in universities, hospitals, and clinics. The education should raise awareness of the disease, especially in the family physicians' group [28]. Everyone should know their level of health and risk for cardiovascular disease and how to prevent the deterioration of health [60]. Risk factors should be known and, if possible, eliminated [60]. It would be beneficial to conduct this education more widely for all PCPs [61]. However, knowledge and approach of family and GPs is still unknown and important to be studied. All of the matters require further concern [61].

4. Screening for Chronic Kidney Disease

Chronic kidney disease (CKD) is the condition of persistent loss of kidney function such that excretory function is reduced (62). Early detection and guidance for treatment of chronic kidney disease (CKD) requires the collaboration of priority health organizations, federal and provincial governments, family physicians, other medical specialists, laboratories, chronic disease service providers, community groups, and the public [63]. With increasing incidences, chronic kidney disease (CKD) is on the list of major morbidities warranting government-driven actions. Collaborating with Health Canada has put CKD awareness, prevention, and early detection as a priority, since untreated, it is usually progressive and ends with end-stage renal disease, which is no longer curable [62]. Usually asymptomatic till late in the course

of the disease, CKD can be diagnosed early by simple lab investigations such as serum creatinine, estimated glomerular filtration rate (eGFR), and a prior history of conditions such as diabetes, hypertension, other cardiovascular diseases, or family history of CKD [64]. CKD is categorized into five stages based on eGFR, which can be further stratified into three metabolic risk groups based on co-morbidities and additional tests [65]. The "5A model" is a widely used behaviour change model based on health promotion principles. "5A's" are Assess, Advise, Agree, Assist, and Arrange [65]. Each "A" describes a step in the behaviour otherwise known as health promoting activities [66]. It is now widely followed by health agencies and organizations to promote healthy activities such as the prevention of obesity and smoking [66]. The model has been successfully modified and improved to involve pregnant women, grade school children, and urban youth, to promote healthy behaviours [65]. The "5A model" is adapted to detect and guide treatment of patients with CKD [66]. Following the "5A" model, family physicians play the roles of first assessors of risk in patients ≥40 years of age, first users to recommend tests for early detection of CKD in at-risk individuals, advise them further in part, according to the eGFR stage, metabolic risk group, and existing co-morbidities or risk factors, guide additional investigations, treatment with medication and/or lifestyle interventions, and referral to nephrology if needed, and regularly arrange follow-ups for query patients, to monitor renal prognosis and treatment effectiveness [67].

4. Management Strategies

In addition to enhancing awareness of CKD's health and financial implications among clinicians and the public, educational efforts should include the importance of public health approaches, particularly preventive health strategies [68]. These approaches should ideally target smokeless tobacco use and obesity as the most important culturally appropriate interventions aimed outside of the clinic, particularly in those with entry GFR 45-60 mL/min/1.73m2, high sodium intake, and low potassium intake [69]. Education to enhance the performance of a test for CKD in those with diabetes and hypertension (urine albumin-to-creatinine ratio) should be provided to healthcare providers [69]. Such efforts must also enhance the adoption of the 2013 Kidney Disease Improving Global Outcomes screening guideline, where screening is required for all with at least a 1.5-fold increase in the risk to develop CKD if GFR >90 mL/min/1.73m2 is supplied in the electronic health record, as is the percentage with laboratory data supplied from past testing [70].

Patient education representatives from the community have long been involved in university-affiliated panel discussions [71]. Educational discussions at faith health institutions and social service agencies may also provide an opportunity to reach both church members and those in need of social services [72]. This would target the many immigrants who have entered the U.S. bore the brunt of CKD disproportionately, particularly Black-tinted groups among Hispanic groups and low-income immigrants from foreign countries who are at increased risk of uncontrolled chronic disease and thus CKD and ESKD [73]. Culturally appropriate media-education outlets may best reach these populations [48]. Regular prime-time airing of CKD education on TV and Spanish-speaking radio stations, with messaging through Instagram, TikTok, and other venues targeting younger audiences should be accelerated [74].

Guidelines recommend controlling albuminuria and blood pressure intensively to prevent the progression of CKD when diagnosed, with an ACE-inhibitor or angiotensin-receptor blocker used with almost one half diagnosed by guideline in a cohort in some urgency but not urgency in comparison to nephrology co-management with low rates of primary care eGFR monitoring with ideally a more intensive eGFR measurement in higher CVD risk groups and those diagnosed beyond CKD G3 but a similar rate of pattern deviation in low rates of ADRBP use [18].

5.1. Lifestyle Modifications

Family physicians should emphasize lifestyle modifications to modify the progression of chronic kidney disease (CKD) (75). Weight control is related to an ideal body mass index of 20–24 kg/m^2 [75]. Patients should limit salt intake, practice exercise for 150 min/week, moderate alcohol consumption of 5–24 g/day for women and 10–49 g/day for men, and quit smoking altogether [76]. Patients with diabetes must control blood glucose levels with medications or dietary measures [76]. Alternatively, patients with hypertension must control blood pressure of 130/80 mmHg [77]. Family physicians should help CKD patients map out these lifestyle modifications and achieve the goals set in the management to actively delay the progression of CKD through diet and lifestyle measures [18]. Health education also includes several aspects: putting an emphasis on treatment of preventable kidney disease patients; recognizing high-risk groups and screening them early; family physicians taking a series of strategies to delay the gene switch-on of hereditary kidney disease such as consulting with a nephrologist before fertilization in those with a family history of hereditary kidney disease; and psychological education about the mental adjustment of different CKD stages is required among patients and their forebears [75]. Family physicians should place emphasis on education about screening high-risk groups of CKD and modifying the progression rate of CKD [75].

5.2. Pharmacological Interventions

Treatment of chronic kidney disease (CKD) approaches, when implemented as early as possible since diagnosis and continued until reaching PLN or ESKD stage, reduce the risk of CKD progression and development of kidney-related and cardiovascular

outcomes [78]. CKD patients should have their cardiovascular risk factors, blood tests (HbA1c, serum creatinine, applicable electrolytes, and lipid profile), and urinalysis evaluated with reminders, targeting to reach UFMB+NC stage very early, where diabetic patients start pharmacological treatment to promote CKD care [79]. Primary care clinics should allow for a 5-minute appointment for reviewing this list of investigations since urine samples could have been brought beforehand [79]. Meanwhile, CKD patients with known CVD, CKD stage 3 or higher, or high CV risk should have their blood tests and use one or more medications: antihypertensive/antidiabetic/antihyperlipidemic/antibo dy nucleoside analogue starting dose [80]. After checking blood tests, nurses or nurse practitioners could prescribe them using a standing order since medications would be ineffective if eGFR was not greater than 20 ml/min/kg [80].

5.3. Referral to Specialists

Chronic kidney disease (CKD), affecting near one in ten adults in the U.S., was identified as a public health challenge by the 2014 Surgeon General's Call to Action to Prevent CKD in the U.S. However, screening rates remain low, and public sick care and later CKD stages predominate [81]. Family physicians (FPs) can enhance early detection and care. U.S. education and policy reforms are urgently needed to prepare FPs to meet this public health challenge partly within team-based models of health care delivery and to facilitate codetection of CKD and diabetes [82]. CKD was defined as a decreased estimated glomerular filtration rate based on creatinine or cystatin-C or increased protein in the urine [82]. Cardiovascular disease, increased CKD risk, and/or demographic information were given to define a CKD high-risk subgroup [83].

Team-based models of care including care facilitators, performance-based incentives, and co-location of community resources are needed to reach and engage more at-risk adults with diabetes in diabetes detection/care and CKD co-detection/care [84]. Obesity, diabetes, and CKD prevalence were consistently higher among those identified with additional/early risk factors, underscoring the need for urgent policy reforms [85]. Screening/referral thresholds of fitness-based versus weight-based lowered costs and numbers, but were associated with increased/earlier heart disease/cardiovascular disease [86].

6. Patient-Centered Care Approaches

Patient-centered care can be defined as healthcare that enables patients to everything the information and support owing to treatment decisions and ensures that treatment is undertaken in the best interests and dignity of the patient [18]. In this sense, the ideal primary care team is one that truly partners with the patients rather than offering care in a paternalistic manner [48]. Primary care providers would benefit from empowerment through nephrology support to partner with patients on a path to discover their best interests and actively participate in their treatment plans [87]. A care system designed around the patient's experience has been shown to improve adherence to treatment, provide a more positive overall health experience, and lead to better health outcomes [88]. In the context of CKD, patients' involvement in understanding how to face disease, the support, both health appointments and community resources, are vital in deciding on whether to proceed with a referral [88].

6.1. Shared Decision Making

Shared decision making (SDM) implementation is established in clinical guidelines in the health care system [89]. SDM is a fundamental part of patient-centered care and is mandated by global health initiatives [89]. The need to shift from traditional clinical decision making (CDM) to collaborative SDM is broadly recognized [90]. When decision making in the clinical encounter takes place, there are two fundamentally different approaches on how to create an agreement between patient and clinician about what to do 263. This process is sometimes referred to as SDM [91]. On one side of the spectrum, clinicians simply provide patients with information or a recommendation derived from their expertise, after which the patient simply decides whether or not to follow this recommendation (i.e., the CDM approach) [92]. This often leads to patient dissatisfaction, even when the recommendation is followed as the treatment of choice [92]. On the other side of the spectrum, there is an interactive process that is commonly referred to as "true shared decision making" (i.e., the SDM approach), in which patients and clinicians work collaboratively towards an agreement, while at the same time facilitating the process by expressing their own viewpoints [91]. Patients express their needs and preferences, and clinicians assist them in understanding the evidence base upon which the treatment options are built, and both parties discuss together in the patient's best interests [93]. SDM thus involves efforts to come to a deliberation in which potential options are communicated and confronted to evaluate and discuss the merits of these options while paying attention to patient values [93]. The patients and their needs and preferences are at the center, and clinicians are in a supportive and facilitating role [93].

7. CONCLUSION

Chronic kidney disease (CKD) is a global health problem which requires a preventive approach in its management [94]. There is a need to raise awareness among family physicians about the opportunity for early CKD detection, and the role of family physicians in its management for better outcomes [95]. Chronic kidney disease (CKD) refers to the loss of kidney function over a period of time or the progression of chronic kidney damage [96]. The most common causes of CKD worldwide are diabetes and hypertension [97]. In developed countries, the prevalence of CKD ranges between 8% and 16% of the adult population [97]. Over

the years, inadequate awareness and poor detection rates, misdiagnosis, or late referral remains common practice among family physicians [1].

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