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A Cross sectional Study of the Knowledge and Practice Patterns of Family Medicine Residents Regarding Chronic Kidney Disease Screening

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ABSTRACT

Background: The postgraduate training in medicine is aimed at equipping the trainee with the necessary skills to practice as an expert. The family physician (FP) is usually the first contact between the patient and the health care system. As such, it becomes imperative to assess the FP trainees' knowledge and practice with regards to chronic kidney disease (CKD). **Patients and Methods**: Self-administered questionnaires were distributed to physicians attending a nationally organized continuing medical education workshop for resident doctors preparing for the part I and part II exit examinations of the National Postgraduate Medical College of Nigerian in the specialty of Family Medicine. **Results**: Seventy six (20 senior residents and 56 junior residents) of the 150 physicians surveyed returned completed questionnaires. Only nine (11.7%) correctly identified CKD as occurring in approximately one in every ten individuals. CKD risk factors correctly identified by the respondents included: hypertension (97.4%), diabetes mellitus (94.4%), human immunodeficiency virus infection (75%), autoimmune diseases (51.3%), cancer (34.2%), advanced age (26.3%) and lower socioeconomic status (22.4%). Urinalysis and estimation of the GFR using prediction equations were correctly recognized as screening modalities for CKD by 72 (94.7%) and 71 (93.4%) respondents respectively. The majority (54.7%) considered proteinuria as significant when it is 2+. Four (5.3%) physicians "Always" screen for CKD risk factors when consulting a patient; 10 (13.3%) "Most times"; 48 (64%) "Sometimes"; 12 (16%) "Occasionally" and one (1.3%) "Never". **Conclusion**: The overall knowledge of CKD prevalence among Nigerian FP trainees attending a workshop is poor; however the knowledge regarding CKD screening is adequate. There exists a gap between CKD screening knowledge and the practice patterns of these physicians.

Key words: Chronic kidney disease; Family medicine, Residents, Screening

Competing interests: None

INTRODUCTION

Chronic kidney disease (CKD) is a pandemic that is under-diagnosed and undertreated. It is estimated that 90% of individuals with CKD in Europe remain unidentified [1]. CKD is usually characterised by progression to end-stage renal disease (ESRD). However, timely medical intervention can slow its progression and prevent ESRD in some instances. In the USA, nearly 26 million persons are currently affected by CKD and the prevalence of ESRD is predicted to reach 785,000 by 2020 [2]. According to the Finnish registry for kidney diseases, the prevalence of ESRD treatment programs in men was 898 and in women 553/million inhabitants in 2006 [3].

In Nigeria, available data indicate that ESRD accounts for 8-10% of all admissions into tertiary hospitals with common causes being hypertension, glomerulonephritis and diabetes mellitus [4-6]. The cost of ESRD programs in Nigeria is quite prohibitive with an average monthly cost of three sessions per week of haemodialysis being approximately $1684 USD if consumables are not recycled [7]. As a result of this, very few patients can afford dialysis beyond 12 months [8] and those that can afford it are under-dialysed [9].

In light of the tendency of CKD to progress to ESRD, the prohibitive cost of ESRD programs and the excess morbidity and mortality associated with CKD current clinical practice guidelines emphasize the need for prevention of end stage renal disease (ESRD) largely by the screening of persons at increased risk of and

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early detection and treatment of CKD [10, 11]. Urine examination for markers of kidney damage (like proteinuria and haematuria) and an estimation of the kidney function (either by the Cock-Croft Gault (CG) formula [12] or the Modification of Diet in Renal Disease [MDRD] study derived equation [13, 14]) using serum creatinine form the mainstay of this screening.

Family Physicians (FPs) are at the frontline of specialized care and have an important role in the early detection and treatment of CKD. International evidence indicates that health systems based on well-structured and organized primary care with adequately trained FPs provide both more cost-effective and more clinically effective care than those with low primary care orientation [1]. It has been acknowledged that the most important role of FPs in the management of CKD patients is early detection, treatment of reversible causes of renal dysfunction and the prevention of progression of CKD [15]. While the literature is replete with reports of physicians' knowledge and practice pattern of CKD management in the developed countries [16-19], studies from developing countries are scarce [20, 21]. We hypothesize that the knowledge and practice pattern of CKD screening among Nigerian FPs is inadequate. This study reports the findings of a national survey of Nigerian FPs in training regarding CKD screening. Materials and

METHODS

This was a cross sectional questionnaire survey of physicians in the Residency Training Program for the award of the Fellowship of the National Postgraduate Medical College in Family Medicine in Nigeria. The residency training program in family medicine in Nigeria is structured into junior (pre-part I) and senior (pre-part II) residency. Each level of training takes 2-3 years with a nationally organized examination at the end of each training period. Self-administered questionnaires were distributed to consecutive physicians attending the nationally organized Revision Course for resident doctors preparing for the part I and part II Fellowship examinations of the National Postgraduate Medical College of Nigeria in the specialty of Family Medicine that held between the 8th and 12th of February 2010 at the Rivers State House of Assembly auditorium.

The questionnaire, in addition to obtaining demographic information, consisted of six multiple choice questions aimed at eliciting the respondent's knowledge of the prevalence, risk factors, screening and progression of CKD and four questions (three of which were on the Likert grading) designed to obtain information regarding the practice patterns of the respondents towards CKD screening. Knowledge of CKD screening was considered adequate if the respondents correctly answered 15 of 21 items. The study was approved by the Human Research Ethics Committee of the Jos University Teaching Hospital and informed consent was obtained from the participants. The results are expressed as frequencies.

RESULTS

Seventy six of the 150 physicians surveyed returned completed questionnaires giving a response rate of 50.7%. The respondents (males 69.7% and females 30.3%) were made up of 20 senior residents and 56 junior residents with a mean age of 36 ± 7 years. The median duration of years of clinical practice was seven years with a range of three to twenty nine years.

Table 1 summarizes the findings of our study. Of the respondents, only nine (11.7%) correctly identified CKD as occurring in approximately one in every ten individuals. Most physicians (42.4%) believed that CKD occurs in one out of every thirty individuals. CKD risk factors correctly identified by the respondents included: hypertension (97.4%), diabetes mellitus (94.4%), human immunodeficiency virus infection (75%), autoimmune diseases (51.3%), cancer (34.2%), elderly (26.3%) and lower socioeconomic status (22.4 %).

Urinalysis and estimation of the glomerular filtration rate (eGFR) using prediction equations were correctly recognized as screening modalities for CKD by 72 (94.7%) and 71 (93.4%) of respondents respectively. Only 13 (17.3%) of the respondents correctly identified persistent proteinuria of 1+ as indicative of CKD. Additionally, 66 respondents (88%) properly identified the use of kidney ultrasonographic scan as a useful tool for detecting CKD. Despite the foregoing, 71 (93.4%) and 42 (55.3%) respondents incorrectly identified blood urea nitrogen measurement and complete blood count as useful screening investigations for CKD respectively. Fifty two percent of the

respondents knew that the progression of CKD could be retarded. Measures correctly identified that can retard the progression of CKD included control of hypertension using the angiotensin converting enzyme inhibitors (89.3%) and angiotensin II receptor blockers (69.3%), the cessation of smoking (58.7%), avoidance of non-steroidal anti-inflammatory drugs (57.3%) and the use of aldosterone antagonists (16%).

Table 1. Knowledge and practice of 76 Nigerian Family Medicine residents towards screening for chronic kidney disease

Characteristic	Number (%)
Risk factors correctly identified	
Hypertension	74 (97.4)
Diabetes mellitus	72 (94.7)
HIV	57 (75)
Autoimmune disease	39 (51.3)
Cancer	26 (34.2)
Advanced age	20 (26.3)
Low socioeconomic status	17 (22.4)
CKD Screening methods correctly identified	
Urinalysis	72 (94.7)
GFR estimation	71 (93.4)
Renal ultrasonography	66 (88)
Level of proteinuria considered significant	
Trace	4 (5.3)
1+	13 (17.3)
2+	41 (54.7)
3+	17 (22.7)
4+	0 (0)
Screening for CKD risk factors at each patient encounter	
Always	4 (5.3)
Most times	10 (13.3)
Sometimes	48 (64)
Occasionally	12 (16)
Never	1 (1.3)
Annual screening of diabetic patients for proteinuria	

HIV: Human immunodeficiency virus; CKD: Chronic kidney disease; GFR: Glomerular filtration rate

Four (5.3%) physicians "Always" screened for CKD risk factors when consulting a patient. The other physicians screened "Most times" (13.3%); "Sometimes" (64%); "Occasionally" (16%) and "Never" (1.3%).Using diabetes as a case scenario for CKD risk factors, only 15 (20%) respondents "Always" screened diabetic patients annually for proteinuria while the majority (80%) "Never" screened or screened "Occasionally". Less than half of the physicians (46.7%) repeated urinalysis when an initial test was for positive for protein. Only a small proportion (9.3%) referred their patients to the nephrologist when the eGFR fell to <30ml/min/1.73m^2. Late referral was practiced by 10% of the respondents while a quarter was not sure when to refer their CKD patients to the nephrologist, continuing therefore to manage such patients on their own. The remainder of the respondents (54.7%) referred in early stages of CKD.

DISCUSSION

The main findings of this study were that i) the overall knowledge of the high prevalence of CKD was poor among the respondents (11.7%); ii) despite the poor knowledge of its prevalence nearly all the physicians (>90%) correctly identified the major risk factors for CKD (i.e. diabetes and hypertension) and the use of urinalysis, renal ultrasonography and eGFR as screening modalities for CKD; iii) r only 5.3% screened their patients for CKD risk factors at every patient encounter and iv) only a small proportion (9.3%) referred their patients with CKD to the nephrologist when the eGFR falls to <30ml/min/1.73m^2. Thus, there exists a gap between the knowledge of CKD screening and its practice among Family Medicine residents.

The findings of our survey compares with available reports. Only 10% of our respondents had adequate knowledge on CKD. This compares well with the findings of Israni and colleagues that reported adequate knowledge of CKD in only 35% of primary care physicians (PCP) in the USA[16]. Similarly, Boulware and co-workers in an earlier survey of US PCPs reported adequate knowledge of CKD in 59% of FPs[17]. The apparently higher level of knowledge reported by Boulware may be attributed to the fact that they used a single patient case scenario to test the knowledge of PCPs.

Our finding that 20% of FPs evaluate their patients for CKD mirrors previous reports among FPs. Charles et al, [18] in a study of PCP, reported that only 19% of FPs were adherent to KDOQI

guidelines on laboratory and radiologic evaluation of patients with CKD. Our findings are also consistent with an earlier report from northern Nigeria, where less than 10% of PCP screened their patients for CKD although the physicians surveyed were non-specialists [21]. In a review of health practices in the state of Georgia, U.S.A, 70% of practices screened fewer than 10% of their patients for CKD [22].

We reviewed our finding regarding the referral of the patient with CKD with available reports that addressed patient referral. Approximately 10% of FPs in our study were adherent to the recommendation to refer patients when eGFR falls below 30ml/min/1.73m2. In a study of 126 PCPs, Charles and co-workers [18] reported that 71% of FPs adhere to guidelines on nephrology referral. This sharp contrast, we believe, is due to the availability of automated eGFR reporting which has been shown to improve CKD recognition and appropriate referral [23]. A quarter of our respondents who were not sure when to refer their CKD patients to the nephrologist, continued to manage such patients on their own. This finding is similar to the report among Pakistani physicians, where 48.2% were not sure when to refer to refer their patients [20].

Our study has several implications for physician education and patient care. Family physicians occupy an important position in the provision of primary care and, therefore, have a vital role to play in the early detection and treatment of CKD. The knowledge-practice gap with regards to CKD screening identified among FPs in this study provides a good opportunity for education on guidelines for the screening and early detection of CKD and training on adhering to such guidelines. More than half (54.7%) of the physicians in our survey referred patients to the nephrologist too early (CKD stages 1-3). Nigeria, with a population of over 140 million inhabitants, has only 103 nephrologists practicing in the country [24]. They will therefore be over-burdened by unnecessary referrals from PCPs. Whereas too early referrals will over-burden nephrologists, late referrals will lead to increased morbidity and mortality for the affected patients; we had previously documented that patients are seen by nephrologists for the first time at ESRD [25]. Educational efforts such as instruction on the use of CKD clinical practice guidelines may help raise awareness of the burden and complications of CKD, benefits of early intervention and improvement in CKD management

We encountered some limitations in this study and as such the results must be interpreted with caution. We surveyed participants attending a conference, hence selection bias may have been introduced into the study and this may limit the generalizability of our findings. An e-mail based survey would have circumvented this. The study was questionnaire based and as such unlikely to be free of recall bias. Additionally, the responses elucidated with respect to practice patterns could not be validated as we would have if we had embarked on an audit of practices, but this would have been extremely cumbersome and expensive. Finally, we did not seek to elucidate the impact of level of training on the knowledge and practice patterns as the number of junior residents far outstrips that of the senior in this study.

We conclude that although the overall knowledge of CKD prevalence among Nigerian FP trainees attending a workshop is poor, the knowledge regarding CKD screening is adequate. There exists a gap between CKD screening knowledge and the practice patterns of these physicians. Educational programs are needed to acquaint the FP with practice guidelines regarding CKD screening and practical steps like automated reporting of eGFR embarked upon by laboratories in the developing world as this may facilitate early CKD recognition and appropriate referrals.

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