

# Chronic kidney disease in Nigeria: Late presentation is still the norm

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## ABSTRACT

**Background:** Chronic kidney disease (CKD) has become a public health problem in Nigeria. Efforts are being geared toward early diagnosis and prevention of CKD. This study involved the evaluation of the referral pattern and mode of presentation of CKD patients at first contact in a tertiary health institution. **Patients and Methods:** Patients' records over an 18 month period were retrieved and the following information extracted: Sociodemographic data, referral hospital, mode of presentation, etiology of CKD, packed cell volume, blood pressure, and estimated glomerular filtration rate (GFR) at first presentation. **Results:** There were 202 CKD patients with a male: female ratio of 1.7:1 and a mean age of  $48.15 \pm 16.69$  years. The median estimated GFR of the patients at presentation was  $3.17 \text{ ml/min/1.73 m}^2$ . The common etiologies of CKD were chronic glomerulonephritis, hypertension, diabetes mellitus, obstructive nephropathy in 69 (34.2%), 47 (23.3%), 38 (18.8%), and 21 (10.4%) respectively. Among these patients, 111 (55%) and 98 (48.6%) had moderate to severe hypertension and anemia, respectively, 173 (85.6%) presented in CKD Stage 5, 101 (50%) required urgent hemodialysis whereas 123 (60.9%) required in-hospital admission. Only (18) 9% of these CKD patients presented by self-referral while (103) 51% were referred from secondary and private health facilities. **Conclusion:** Most Nigerian CKD patients still present very late to nephrologists implying that the present preventive strategies have not yielded desired results. Early diagnosis and referral of CKD patients could be better achieved through regular education of the public and retraining of health workers especially those in primary and secondary health institutions.

**Key words:** Chronic kidney disease, late, pattern, presentation, referral

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## INTRODUCTION

Chronic kidney disease (CKD) has become a public health problem due to its increasing prevalence globally and associated high morbidity and mortality.<sup>1-3</sup> The burden of CKD is more felt in developing countries like Nigeria where there is no health insurance to meet the huge financial demands the disease places on its sufferers and their families.<sup>4</sup>

Majority of CKD patients in Nigeria present late to nephrologists when they are already uremic and requiring renal replacement therapy (RRT).<sup>3</sup> This may be due to both patient and primary physician-related factors.

Early referral of CKD patients to nephrologists is key to retarding progression to end-stage renal disease, reducing hospitalization, cost of health care, and improving patients' survival before and eventually after commencement of RRT.<sup>5-7</sup>

Prevention and early detection of CKD are the main instruments for combating CKD in the world today. To this effect, programs have been initiated to actualize this goal. One of such is the World Kidney Day initiative established by the International Society of Nephrology and International Federation of Kidney Foundation

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marked yearly worldwide for the past 10 years with the primary objective of educating and enlightening the public on prevention and early detection of kidney disease as well as giving support to kidney disease sufferers. Nigerian nephrologists have been actively involved in the World Kidney Day initiative, and there has been an increase in public enlightenment campaigns on CKD.

The goal of this study was to assess the sociodemographic, clinical characteristics, and referral pattern of CKD patients at the time of first presentation to a tertiary hospital in southwest Nigeria. This will help determine if existing preventive nephrology programs and strategies are achieving desired results and also to identify areas requiring improvement.

## PATIENTS AND METHODS

This study was a descriptive retrospective survey carried out in Kidney Care Centre, Ondo City, a tertiary health institution in Southwest Nigeria. CKD patients who presented to the center over an 18 month period from July 2014 to December 2015 were recruited for the study. Patients below the age of 18 years and those already on RRT were excluded. The case records of the patients were retrieved, and the following information extracted: Sociodemographic data, clinical characteristics at presentation and mode of referral to the nephrologist. Ethical approval was gotten from the hospital's ethical committee on research.

The Modification of Diet in Renal Disease (MDRD) equation was used to estimate glomerular filtration rate (GFR). CKD staging was done using estimated GFR as follows: Stage 1 (GFR of  $\geq 90$  ml/min with evidence of kidney damage), Stage 2 (GFR of 60–89 ml/min with evidence of kidney damage), Stage 3 (GFR of 59–30 ml/min with or without evidence of kidney damage), Stage 4 (GFR of 15–29 ml/min with or without evidence of kidney damage), and Stage 5 (GFR  $< 15$  ml/min with or without evidence of kidney damage).<sup>8</sup>

Hypertension was graded according to the JNC7 guidelines as mild hypertension: Blood pressure (BP) between 140–159/90–99 mmHg, moderate hypertension: BP between 160–179/99–109 mmHg and severe hypertension: BP  $\geq 180/110$  mmHg.<sup>9</sup>

Anemia was defined as hematocrit  $< 36\%$  in females and  $< 39\%$  in males.<sup>10</sup>

Anemia was graded as severe anemia (hematocrit  $< 18\%$ ), moderate anemia (hematocrit of 18–25%), and mild anemia (hematocrit of 26–35% for females and 26–38% for males).

## Data analysis

Data generated were analyzed using the Statistical Package for Social Sciences Inc<sup>®</sup>, Chicago released 2008, IBM Corp, New York). Results were presented in tabular form. Discrete variables were presented as frequency and percentages. Continuous variables were presented as mean and standard deviation for unskewed data and median, interquartile range for skewed data.

## RESULTS

A total of 202 CKD patients seen during the period reviewed, met the inclusion criteria. The male: female ratio was 1.7:1. The majority of the CKD subjects were married and below 65 years of age; accounting for 169 (83.7%) and 165 (81.7%) of the CKD subjects respectively. About 75% of the CKD patients were gainfully employed [Table 1].

The mean age, systolic BP, diastolic BP, hematocrit of the study population were  $48.15 \pm 16.69$  years,  $154.66 \pm 35.20$  mmHg,  $91.56 \pm 23.13$  mmHg and  $24.44 \pm 7.08\%$ , respectively. The median serum creatinine and estimated GFR of the study population were 997 (764.6)  $\mu\text{mol/L}$  and 3.17 (5.05) ml/min/1.73 m<sup>2</sup> respectively [Table 2].

The common presenting complaints of the study patients were body swelling in 143 (70.8%), malaise in 100 (49.5%), nausea and vomiting in 104 (51.5%), and oliguria in 95 (47%) [Table 3]. Forty-three (21.3%) had mild hypertension, 46 (22.8%) had moderate hypertension, and 65 (32.2%) had severe hypertension at presentation [Figure 1]. Severe, moderate, and mild anemia were present

**Table 1: Sociodemographic characteristics of study population**

Parameters	Frequency (%)
Age (years)	
$\geq 45$	85 (42.1)
45–64	80 (39.6)
$\geq 65$	37 (18.3)
Gender	
Male	128 (63.4)
Female	74 (36.6)
Marital status	
Single	24 (11.9)
Married	169 (83.7)
Divorced	7 (3.5)
Widowed	2 (0.9)
Occupation	
Civil servant	44 (21.8)
Artisan	26 (12.9)
Trading	71 (35.1)
Farming	11 (5.4)
Retiree	20 (9.9)
Unemployed	27 (13.4)
Not specified	3 (1.5)

in 30 (14.9%), 68 (33.7%), and 43 (21.3%) respectively at presentation. Seven (3.5%) were in CKD Stage 3, 22 (10.9%) in Stage 4 and 173 (85.6%) in Stage 5. At the time of presentation, 123 (60.9) required in-patient’s care and 101 (50%) required urgent RRT. None of these patients had been vaccinated against hepatitis B [Table 3].

The common etiologies of CKD were chronic glomerulonephritis, hypertension, diabetes mellitus, obstructive nephropathy in 69 (34.2%), 47 (23.3%), 38 (18.8%), and 21 (10.4%) respectively [Figure 2].

Only (18) 9% of these CKD patients presented by self-referral while (103) 51% were referred from secondary and private health facilities [Figure 3].

**DISCUSSION**

This study showed that most CKD patients still present very late, requiring in-patient care and emergency RRT

**Table 2: Physical, hematological and biochemical parameters of chronic kidney disease patients**

Parameters	Mean (SD)/median (IQR)
Age (years)	48.15 (16.69)
Systolic BP (mmHg)	154.66 (35.20)
Diastolic BP (mmHg)	91.56 (23.13)
PCV (%)	24.44 (7.08)
Serum creatinine* (µmol/L)	997.4 (764.6)
Estimated GFR* (ml/min/1.73 m <sup>2</sup> )	3.17 (5.05)

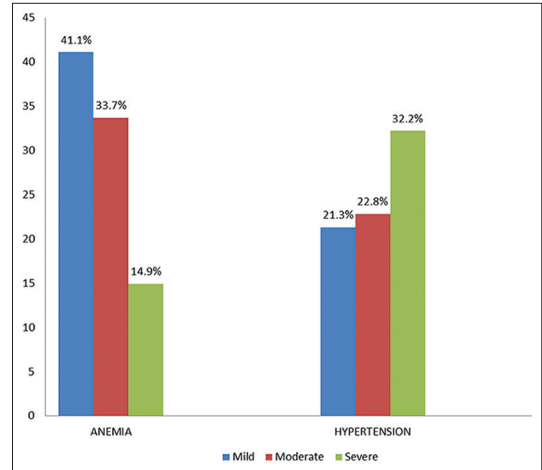
\*Skewed data expressed as median (IQR). IQR – Interquartile range; GFR – Glomerular filtration rate; BP – Blood pressure; PCV – Packed cell volume; SD – Standard deviation

**Table 3: Clinical characteristics of study population**

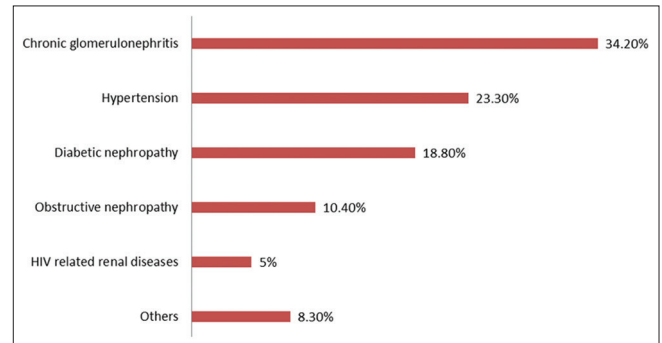
Characteristics	Frequency (%)
Presenting complaints	
Body swelling	143 (70.8)
Malaise	100 (49.5)
Nausea and vomiting	104 (51.5)
Oliguria	95 (47.0)
Breathlessness	66 (32.7)
Hiccups	65 (32.2)
Nocturia	63 (31.2)
Frothiness of urine	56 (27.7)
Poor appetite	35 (17.3)
CKD stage at presentation	
3	7 (3.5)
4	22 (10.9)
5	173 (85.6)
Type of care	
In-patient care	123 (60.9)
Out-patient care	79 (39.1)
Urgent HD at presentation	
Yes	101 (50)
No	101 (50)
Hepatitis B vaccination status	
Vaccinated	0 (0)
Not vaccinated	202 (100)

CKD – Chronic kidney disease, HD – Hemodialysis

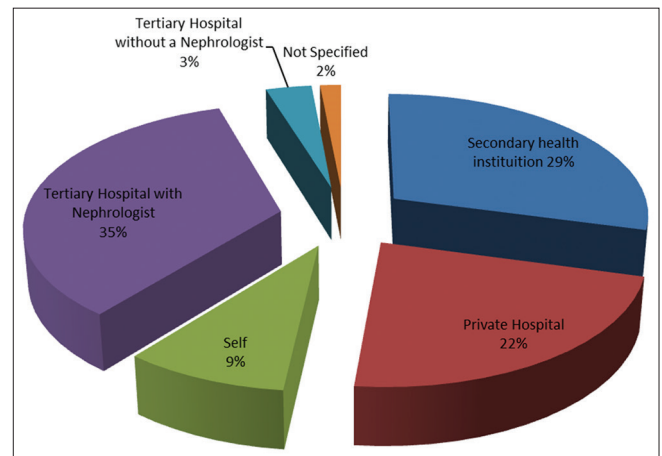
despite present efforts geared towards prevention and early detection of CKD. There were more male CKD patients in this study which is similar to previous studies.<sup>3,11-13</sup> This may be because CKD is more common in males and men tend to have more financial power to access health care services. More than 80% of these patients were young and



**Figure 1: Degree of hypertension and anemia among chronic kidney disease Patients at first presentation**



**Figure 2: Etiology of chronic kidney disease**



**Figure 3: Referral pattern of CKD patients presenting at Kidney Care Centre**

middle aged which also agreed with previous reports from Nigeria and other parts of sub-Saharan Africa<sup>3,11,12</sup> unlike in developed countries where the elderly are more commonly affected by CKD.<sup>1,14</sup>

Common etiologies of CKD in this study are chronic glomerulonephritis, hypertension, diabetes mellitus, and obstructive uropathy similar to the findings in previous studies.<sup>1,3,11,12,15</sup> Therefore, persons with risk factors of the aforementioned conditions should be identified early and treated to therapeutic targets as recommended by standard guidelines, to reduce the incidence of CKD.

Most of the patients were in CKD Stage 5 at the time of first presentation similar to findings from previous reports.<sup>3,12</sup> A major proportion of the patients already had uremic symptoms at the time of first presentation to the nephrologist and required emergency RRT. Several problems may crop up when CKD patients require emergency RRT. One of such is the lack of appropriate vascular access for hemodialysis.

About half of the CKD patients in this study were referred from private hospitals and secondary health facilities where there were no nephrologists. This reiterates the need for health workers at this level of care to be familiar with CKD management guidelines to reduce the burden of the disease through early risk identification, prevention, and early referral to the nephrologist. This could be achieved by incorporating such guidelines into the continuing medical education programs organized for health workers.

Although factors associated with late presentation were not assessed in this study, both physician and patient-related factors have been reported to be responsible in previous studies. Patient-related factors include poor health seeking behavior, erroneous belief that their health problems resulted from spiritual attack and lack of funds to seek proper health care while physician-related factors include perception preferences and knowledge deficits.<sup>16-18</sup> An increase in public awareness and education on early features of kidney disease geared toward improving appropriate health-seeking attitude among Nigerians is necessary. This can be achieved by collaborating with religious institutions since some of these patients present initially to spiritual homes because of the erroneous belief that spiritual forces are the source of their ill-health.

A significant proportion of these patients presented with moderate to severe hypertension and anemia, both of which are cardiovascular risk factors that contribute to left ventricular hypertrophy and subsequent mortality in CKD patients.<sup>19-21</sup> Anemia has been reported to be associated with increased expenditure and hospitalization rates in CKD patients.<sup>22,23</sup> Those with severe anemia had to receive blood transfusions thereby increasing the cost of care.

None of the patients had received vaccination against hepatitis B, which is part of the predialysis care in CKD

patients because of the increased risk of hepatitis B virus infection during hemodialysis and blood transfusion. It is recommended that hepatitis B vaccination be administered early in CKD for it to be effective.<sup>24</sup>

Furthermore, due to the late presentation of these patients, they do not have the opportunity to benefit from interventions such as early correction and treatment of anemia, hypertension, proteinuria, calcium, and phosphate abnormalities with appropriate and recommended therapeutic agents which have been reported to be cost-effective and also have indirect effects in reducing disability and improving productivity in early stages of CKD.<sup>25,26</sup>

Sixty-one percent of the patients in this study required in-patient's care at the time of first presentation due to the fact that they were quite ill. The time spent by these patients on admission has adverse effects on the overall nation's economic activities and their families because most of these patients were gainfully employed and constituted the economically productive age group in our nation. Furthermore, hospitalization of CKD patients has been associated with increased morbidity and mortality.<sup>27</sup> This is avoidable if patients are seen earlier before reaching advanced stages of CKD.

All the patients in this study who required dialysis used temporary vascular access due to their poor clinical state at the time of presentation. This is more expensive compared to native arteriovenous fistula which offers higher blood flow rates and better dialysis efficiency. Initiating hemodialysis with temporary vascular access is also associated with infection, hospitalization, poor patient survival, increased cost and mortality in CKD patients compared to the use of arteriovenous fistula.<sup>28,29</sup>

The limitation of this study is that we depended on the accuracy of previous documentation in the patients' records. The strength of this study, however, lies in the fact that it showed a cogent need to re-strategize efforts toward prevention and early detection of CKD as the present strategies have not achieved the desired results.

The following recommendations are proposed:

1. Regular health education of Nigerians aimed toward improving their health seeking attitude and the adoption of lifestyles that supports healthy kidneys
2. Religious institutions should be involved in educating and encouraging their followers to improve their health seeking attitudes while yet seeking spiritual intervention and healing
3. There should be continuous medical education for health workers, especially those in primary and secondary health institutions aimed at early diagnosis, treatment, and referral of CKD patients to nephrologists
4. There is also need to adequately upgrade more health institutions to train more nephrologists in Nigeria.

## CONCLUSION

This study concludes that CKD is more common in males and the economically productive age group in Nigeria, with majority of them presenting very late to nephrologists in uremic state and commencing RRT without adequate predialysis care. The present strategies toward prevention and early detection of CKD have not yet yielded the desired results. Furthermore, most of the causes of CKD in Nigeria are preventable if at-risk individuals are identified early and effectively managed.

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## Conflicts of interest

There are no conflicts of interest.

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