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Chronic Kidney Disease in Jigawa State, Nigeria; A silently Emerging Epidemic?

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ABSTRACT

***Purpose**: The study was conducted to examine the trend of chronic kidney disease (CKD) in as seen at Rasheed Shekoni Teaching Hospital (RSTH), Dutse, a state referral centre for CKD cases in Jigawa state over a six-year period from January 2015 to December 2020.*

***Methods**: Retrospective research design was used where all the 621 cases seen in the facility over the study period were retrieved and reviewed. Ethical clearance was obtained from the Research and Ethics Committee of RSTH. Data was analysed using frequency tables, charts and multiple regression analysis.*

***Results**: The result revealed the mean age of the cases as 39±1 and 62% were males. While the CKD burden between 2016 (51) and 2016 (47) were relatively lower than the later years, a marked increase in the number of CKD cases was witnessed in the facility in 2017 (147) and the curve plateaued at such high prevalence through 2018 (155) and 2019 (151) until 2020 where a drastic drop (70) was witnessed were only 11.2% of the cases were seen.*

***Conclusion**: The findings further revealed having chronic glomerulonephritis, comorbidities of hypertension and chronic glomerulonephritis and, hypertension and diabetes, being 60 years & above and being male ($p<0.05$) as the predictors of having CKD among the patients seen at the facility. It was concluded that, there is a growing trend in the burden of CKD in the state and there is need for further investigations to determine the factors behind it in order to proffer solution to the problem.*

Background

Chronic kidney disease (CKD) with its associated morbidity and mortality constitutes a global public health problem with recent estimates showing the disease burden in a steady rise across the world. The global CKD prevalence in 2017 was put at 9·1%, roughly 700 million cases which shows a 29.3% increase in global burden of the disease from 1990 (Saminathan et al., 2020a) (Saminathan et al., 2020b). CKD is gaining attention globally due to the rapid rise in its prevalence as 1 in every 10 adults is estimated to have the disease, a figure played down by available empirical data as the tip of an iceberg of the covert disease, the massive cost of treatment, and an understanding of its foremost

role in increasing cardiovascular disease risk amongst others (Barsoum, 2006; Olanrewaju et al., 2020). CKD is a leading contributor to global morbidity and mortality from non-communicable diseases, and it must be stemmed to meet the UN's Sustainable Development Goal target to reduce premature mortality from non-communicable diseases by a third by 2030 (Himmelfarb & Ikizler, 2010).

Chronic kidney disease is defined as kidney damage or glomerular filtration rate (GFR) <60 mL/min/1.73 m² for ≥3 months(Levey, Atkins, Coresh, & al, 2007). CKD affects about 1 in 10 adults and accounts for millions of premature deaths Worldwide (Neuen, Chadban, Demaio, Johnson, & Perkovic, 2017). CKD represents a significant public health problem because of the associated high morbidity and mortality, mainly attributable to elevated cardiovascular risk(Gregg & Hedayati, 2017). It is a growing challenge in low- and middle-income countries, particularly in sub-Saharan Africa where regional epidemiologic data may be lacking but studies were consistent in reporting prevalence fluctuating between 10.1-13.9 %(Abd ElHafeez et al., 2018; Stanifer et al., 2014).

The prevalence of CKD in Nigeria has not been properly gauged due to the absence of national data on the disease however, the diseases has been studied by independent researchers in recent times and yet it is still believed that there is insufficient data required to estimate its true burden due to the narrow sampling spread of those studies and the inconsistencies in their results that are usually attributed to the methods used in the respective studies (Olanrewaju et al., 2020). In a systematic review covering seven cross-sectional population-based studies, two of the studies that used the Cockcroft–Gault reported a prevalence of 24.4% and 26%, Four of the studies used the MDRD and a lower prevalence 12.3%, 14.2%, 2.5%, and 13.4% were reported while, the other study utilized the CKD-EPI equation and reported the prevalence as 11.4%. The male to female ratios of CKD prevalence in the six studies were 1:1.9, 0.8:1, 1:1.6, 1:2, 1:1.8, 1:1.4, and the observed risk factors in the studies were old age, obesity, diabetes mellitus, hypertension, family history of hypertension, family history of renal disease, low-income occupation, use of traditional medication, low haemoglobin, and abdominal obesity (Chukwuonye et al., 2018).

Other studies within Nigeria conducted at different times revealed regional disparities in the burden of CKD with the scourge highest in the most populous portion of the nation, the North-western region (26%) (Chukwuonye et al., 2018), 18% in South west (Oluyombo et al., 2013), 12% in North-Central(Olanrewaju et al., 2020) and 11.5% in South-East (Ulasi et al., 2013).

Renal replacement therapy remains the gold standard for the management of CKD worldwide. The number of people receiving renal replacement therapy globally exceeds 2·5 million and is projected to double to 5·4 million by 2030; however, in many countries, there is a shortage of renal replacement services, and an estimated 2·3–7·1 million adults have died prematurely from lack of access to this life saving intervention(Liyanage, Ninomiya, & Jha, 2015). In Africa, in addition to the dearth of renal replacement services for CKD patients, the success rate liked to the therapy is also undesirably low as a recent study trying to underline this fact reported that 90% of CKD

patients die within 90 days of commencing dialysis(Olanrewaju et al., 2020).

The exact burden of chronic kidney disease in Nigeria and Jigawa state in particular is not known. While few studies were conducted on CKD in Jigawa state, barely any tried to estimate the exact size of the problem and the patient inherent factors surrounding the occurrence of the disease in the state despite preliminary clinical data showing a growing number of CKD cases in the state over the last few years. This informed the need for this study which was conducted at Rasheed Shekoni Specialist Hospital, a premier health facility that is serving as referral centre for renal replacement therapy in the state.

Material and Methods

Design: Descriptive retrospective research design was used for the study where health records of CKD patients seen and managed as having CKD were used.

Population and Sampling: The CKD patients seen and managed at Rasheed Shekoni Specialist Hospital Dutse, Jigawa State constitute the study population. Total enumerative sampling technique was used where all the 621 CKD patients seen in the facility over the study period were used for study.

Data Collection: Structured checklist was used to summarise the data retrieved from the medical and health records of all the CKD patients seen at the hospital over the study period.

Ethical Consideration: Clearance and permission for the conduct of the study were obtained from the Research and Ethical Committee of Rashid Shekoni Specialist Hospital Dutse, Nigeria. For information management, anonymity of all the patients whose records were reviewed and confidentiality were strictly maintained.

Result

Sociodemographic Data (n= 621)

Table 4.1: Sociodemographic Distribution of the Patients with Chronic Kidney Disease

No	Variable	F	%
	Gender		
1.	Male	382	62
2.	Female	239	38
	Religion		
1.	Islam	615	99
2.	Christianity	6	1
	Ethnicity		
1.	Hausa/Fulani	585	94
2.	Igbo	3	1
3.	Yoruba	12	2
4.	Others	21	3
	Age		
1.	19 years and below	96	15
2.	20-39 years	211	34
3.	40-59 years	230	37
4.	60-79 years	84	14
	Mean age = 39±1		

As shown in Table 1, majority (62%) of the CKD patients were males and most (94%) were Hausa/Fulani by ethnic extraction. The mean age of the patients was 39±1 with 37% and 34% between the age ranges of 40-49 years and 20-39 years respectively while 15% were of 19 years of age and below. Only 14% of the cases were between the ages of 60-79 years.

Prevalence of CKD (n = 621)

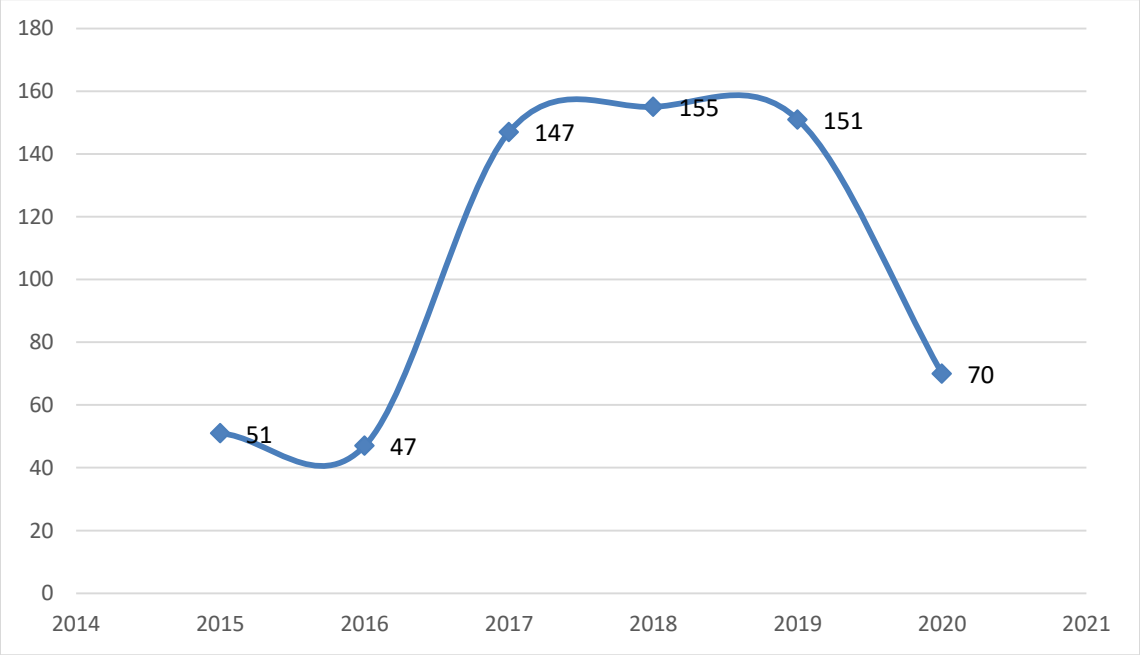

Figure 1: A scatter pot showing the fluctuation in CKD cases admitted and managed in at the facility between January 2015- December 2020

A marked increase in the number of CKD cases was witnessed in the facility between 2016 (47) to 2017 (147) from where the curve plateaued at such high prevalence until 2020 where a drastic drop (70) was witnessed.

Predictors of having chronic kidney disease (CKD)

No	Predictors	B	Sig.	R
1.	Chronic glomerulonephritis	.681	.000*	
2.	Diabetes mellitus	-.010	.453	
3.	COPD	-.483	.000	
4.	Bladder cancer and bladder outlet obstruction	-.009	.364	
5.	Hypertension and chronic glomerulonephritis	.683	.000*	
6.	Hypertension and diabetes mellitus	.517	.031*	0.741
7.	19 years & below	-.058	.000	
8.	60 years & above	.019	.003*	
9.	20-39 years	-.037	.000	
10.	Male	.791	.000*	
11.	Female	-.037	.431	

Dependent Variable: Chronic Kidney Disease * Significant at 0.05

COPD: Chronic Obstructive Pulmonary Disease

From the Table above, for predictors of having CKD, multiple regression analysis revealed having chronic glomerulonephritis, being 60 years & above and being male, having comorbidities of hypertension and chronic Glomerulonephritis, and hypertension and diabetes Mellitus as significant predicators of having CKD ($p<0.05$) as they collectively account for 74.1% ($R=0.741$) of cases

Discussion

The results show that the 62% of the participants are male with 37% of the entire study population between 40-59 years. The socio-demographic characteristics of in this study might not be unconnected to the study area where most of the working population both in private and public sector are male. Though, Naicker (2013) and Ogundele (2018) infer that CKD usually affects adult between the ages of 20-50, this study's high burden in the same age category accounts for 71% of the total cases reported here. Also in this regard, both Naicker (2013) and Ogundele (2018) reporting on end-stage renal disease in Sub-Saharan Africa (SSA) concur by suggesting that disease conditions such as hypertension and glomerular diseases. However, Ogundele (2018) further suggests that use of traditional herbal medicines by disadvantaged populations in SSA is often associated with cases of kidney diseases.

In terms of specific indices, Naicker (2013) reported that hypertension accounts for 29.8% of cases in Nigeria. These co-morbidities have been suggested to be present due to urbanization, ageing, lifestyle modification (and possible delayed medical screening associated with poor health systems) in SSA (Stanifer et al., 2014). Nonetheless, communicable and non-communicable diseases (often undiagnosed) are markedly correlated in literature (Matsha & Erasmus, 2019; Stanifer et al., 2014). Thus with projections of increase in prevalence in non-communicable disease, there is a high chance of increased cases of CKD in SSA and especially in poor resource areas such as Jigawa.

Though results from the current study affirms what exists in the literature in terms of precursors to CKD, the socio-demographic profile of the setting i.e. largely poor population with poor education and undeveloped health systems suggests that there is a high possibility of the indicies of CKD escalating. Also, this study did not examine the association of the CKD with HIV which the literature suggests to correlate. Furthermore, this study did not examine the treatment options for the patients diagnosed with CKD such as Renal Replacement therapy (RRT) (Naicker, 2013; Ogundele, 2018). However, despite the improved prognosis of using this therapy, the associated cost of the treatment does not favour the patents due to majority of treatment cost are provided for by them. As such prevention of development of the disease (Matsha & Erasmus, 2019) should be emphasized and a public health policy (Perico & Remuzzi, 2014) to address this should be developed, implemented and evaluated with key stakeholders including community members.

Conclusion: The study was conducted in Rashid Shekoni Specialist Hospital Dutse, Nigeria using descriptive retrospective research design to examine the trend of chronic kidney disease (CKD) . The results show that the 62% of the participants are male with 37% of the entire study population between 40-59 years. With the projections of increase in prevalence in non-

communicable disease, there is a high chance of increased cases of CKD in Sub Saharan Africa and especially in poor resource areas such as Jigawa State in Nigeria.

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