REVIEW ARTICLE

Etiology of Chronic Kidney Disease in Nigeria and Management Challenges

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ABSTRACT

The prevalence of chronic kidney disease (CKD) is increasing globally and is one of the noncommunicable diseases associated with increase mortality globally in the last two decades. The prevalence of CKD in Nigeria, it is 1.6% to 12.4%. Ninety percent of end-stage renal disease (ESRD) patients are said to die within 3 months of commencing dialysis. Indices are even worse in resource poor countries like Nigeria where prevention and adequate intervention are usually hampered by funds. In regions like Nigeria, it will be cheaper to prevent CKD than treating its complications. Hence, it is important to identify the common etiologies of CKD in Nigeria and prevent or promptly address them before causing irreversible damage to the kidneys. The most common cause of CKD in Nigeria includes hypertension, glomerulonephritis and diabetes mellitus. Many of these etiologies are preventable/treatable and should be looked for as a major way to reduce the incidence of CKD in Nigeria. Challenges identified in Nigeria, propagating CKD include westernization, inadequate manpower, late presentation, diagnostic challenge and poorly equipped facilities. Interventions like encouraging healthy lifestyle, making available essential drugs, training of health personnel, subsidized cost of treatment, legislation and policies to curb drug abuse. Therefore, resource-poor settings should focus on creating more awareness and making legislations and/or policies focused on these preventable causes of CKD as this is more realistic and effective in these settings.

Keywords: Chronic kidney disease, Nigeria, Africa, end-stage renal disease, hypertension, diabetes mellitus

The prevalence of chronic kidney disease (CKD) is increasing globally and is one of the many noncommunicable diseases associated with increased mortality in the last two decades.[1] The prevalence of CKD in West Africa is 16%, and in Nigeria it is 1.6% to 12.4%.[2] Ninety percent of end-stage renal disease (ESRD) patients are said to die within 3 months of commencing dialysis.[3] Indices are even worse in resource-poor countries like Nigeria where prevention and adequate intervention are usually hampered by funds.[4,5] In a study by Ulasi et al, only 59% of all ESRD patients needing dialysis during the period of study were able to afford it, because most patients pay out of pocket.[4]

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In regions like Nigeria, it will be cheaper to prevent CKD than treating its complications. Hence, it is important to identify the common etiologies of CKD in Nigeria and prevent or promptly address them before they cause irreversible damage to the kidneys.

ETIOLOGY OF CKD IN NIGERIA

Olanrewaju et al in his study showed that hypertension is the commonest cause of CKD[3] in Nigeria. Similar findings were found by Odubanjo et al indicating that hypertension and chronic glomerulonephritis are the most common causes of CKD in the region.[2] In another study, the common causes were chronic glomerulonephritis, hypertension, diabetes mellitus and obstructive nephropathy in the following percentages, 34.2%, 23.3%, 18.8% and 10.4%, respectively.[6] Below is the list of etiologies of CKD in Nigeria from different researchers:[2,3,6-8]

- Hypertension
- Chronic glomerulonephritis
- Diabetes mellitus
- Obstructive nephropathy
- Sickle cell nephropathy

- Autosomal dominant polycystic kidney disease
- Chronic interstitial nephritis
- HIV-associated nephropathy (HIVAN)
- Chronic pyelonephritis
- Chronic kidney disease of unknown origin (CKDu).

Many of the above etiologies are preventable/treatable and should be looked for as a major way to reduce the incidence of CKD in Nigeria.

Most studies agree that hypertension, chronic glomerulonephritis and diabetes mellitus are the most common causes of CKD in Nigeria,[2,3,6,8] which is not different from that of international studies.[9,10] Hence, majority of the interventions towards preventing CKD should be directed towards these.

A study conducted in the Northeast part of Nigeria by Sulaiman et al suggests that CKDu makes up to 20.5% of causes of CKD in the region; however, the environmental and cultural risk factors are yet to be investigated.[11]

The prevalence of sickle cell nephropathy is 3.33%,[12] according to a study by Akaba et al; however, Bukar et al found that the prevalence in the northern region of the country was as high as 38.9%, which increased with advancing age.[13] This is significant because Nigeria has the highest burden of sickle cell disease worldwide, affecting about 4 to 6 million people. About 3.5% of patients with sickle cell nephropathy are in ESRD requiring renal replacement therapy.[13] This is a great challenge because their outcome is lower in terms of morbidity and mortality when compared with the non-sickle cell transplant population.[13] Close and regular clinic visits for follow-up and interventions like hydroxyurea have been identified to slow down the progression of CKD in sickle cell nephropathy.

HIVAN is the most common form of kidney disease resulting directly from HIV infection.[14] Prevalence of kidney disease among HIV patients ranges between 22.9% and 51.8%, and is associated with significant morbidity and mortality.[15] The black race in particular has been found in several studies to be an important risk factor for the development of HIVAN.[14] Commercial sex workers and intravenous drug abusers have been identified as a major driver of HIV infection in Nigeria,[15,16] therefore it will be wise to put policies in place to curb this.

LIFESTYLE IN NIGERIA

The prevalence of hypertension and diabetes mellitus has been consistently on the increase, and is projected to rise further.[17,18] Major drivers of this alarming rise have been attributed to westernization and lifestyle, which include increasing age, increasing body mass index (BMI), physical inactivity, urban dwelling, unhealthy diet, stress, smoking and alcohol.[19,20]

Despite the various efforts and initiatives to prevent or manage hypertension, there are still some barriers limiting optimal outcomes. These barriers can exist at the level of patients, staff or health system and administration. Such barriers include a lack of funding, which affects basic day-to-day operation of health care facilities, scarcity of and difficult access to health care centers in a community, staff shortages in health care centers, shortage of drugs in clinics and dispensaries, limited availability of equipment and insufficient maintenance and insufficient patient health education and communication in clinics.[21]

Most doctors prescribe lifestyle modifications to treat hypertension rather than preventing hypertension; hence, opportunity for primary prevention is usually missed.[22]

CHALLENGES AND SOLUTION IN MANAGEMENT

Hypertension

Prevalence of hypertension in Nigeria ranges from 8% to 46.4%[23] but the percentage of people who take their medications is just 60% in a study conducted by Akpa et al in Port Harcourt.[24] This is similar to the nonadherence global figure of 43% to 65.5%.[25] Most people do not get regular health checks until they fall sick or develop complications related to long-standing hypertension; therefore, more awareness and health education of Nigerians to seek healthy health practices is needed.[26] Single-pill combined therapy has also been shown to improve adherence in hypertensive patients;[24,27] unfortunately they are more expensive in this region compared to single pill.[28,29] Pharmaceutical companies should make efforts to get these drugs produced locally to make it more affordable without reducing the quality.

Controlling hypertension is set to cut down cardiovascular mortality by 15%[30] and this, consequently is likely to impact on the incidence of CKD.[31,32]

Late Presentation

Opportunity for early diagnosis are missed because many patients with kidney disease present late to the hospital.[6] Many of the patients would have first visited quacks or tradomedical personnel who might have

prescribed herbs or cocktail of drugs that may have precipitated or worsened kidney impairment.[33] A study by Li et al showed that there is high patronage of the tradomedical personnel in Ibadan (largest city in West Africa), which can be addressed with both western education and adequate health education.[34]

Diagnostic Challenge

Renal biopsy is key in the diagnosis of many glomerulonephritides, which will also influence the line of management.[35,36] In a study conducted by Okani et al, it was discovered that there has been a decline in the request for renal biopsy by the nephrologists. This was attributed to the lack of trained health personnel, poor health insurance scheme and lack of facilities.[37] The cost of this procedure can be subsidized by the government to make it more affordable for the patients. Physicians should be supported by society and government in form of financial and career developing grants as performing large numbers of biopsies will help improve their skills and also give them an opportunity to train younger doctors.

Abuse of Analgesics

Abuse of nonsteroidal anti-inflammatory drugs (NSAIDs) is also very common especially among youths.[38] Prevalence of drug abuse in Nigeria is said to be as high as 22%,[38] which is similar to international prevalence of 24%.[39] This is possible because many drugs are sold over-the-counter without prescription.[40,41] This can be curbed by appropriate legislation and policies and enforcement of these policies to prevent over-the-counter prescriptions of these potentially nephrotoxic medications.[42]

Status of Dialysis Facilities

The number of dialysis centers in Nigeria increased from 27 in 2006 to 186 in 2021 while the dialysis population increased from 300 in 2000 to over 3,000 in 2018.[43,44] This shows that the number of dialysis centers in Nigeria compared to the number of patients requiring dialysis is grossly inadequate.

Public-private partnership (PPP) in hemodialysis delivery should be encouraged as this has been shown to increase the number and sustainability of hemodialysis centers in Nigeria.[45]

Manufacturers of drugs and equipment for health services related to treating kidney diseases and renal replacement therapy, should be encouraged to make them locally so as to make them more affordable as is done in some other countries.[46]

Status of Transplant Centers

Though kidney transplant is the preferred renal replacement therapy for patients with end-stage kidney disease, it is only accessible to a few due to the high costs and lack of infrastructure. About 90% of kidney transplant recipients had their transplants in India,[47,48] the few transplants done in Nigeria are more in the Private sector.[49] Funding is a major limitation to kidney transplant in Nigeria in addition to sourcing for donors.[49]

PPP can also be deployed here with more funds allocated to the health sector by the government. Bilateral relationship should be formed with high volume kidney transplant centers to help develop transplant centers in the country.

Paucity of Manpower

Nigeria currently has two major bodies awarding Nephrology fellowship to doctors. Nigeria has only 240 nephrologists, 697 registered dialysis nurses and 120 dialysis technologists/technicians, many of whom have left the country to seek better opportunities. This is grossly inadequate to cater to the large CKD population in the country. Policies and incentives, especially financial, can be put in place to encourage young doctors to choose Nephrology as a subspecialty. A healthy working environment should also be setup and encouraged.

CONCLUSION

Resource-poor settings should focus on creating more awareness and making legislations and/or policies focusing on these preventable causes of CKD as this is more realistic and effective in these settings.

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Serum Uric Acid Levels and Risk of Gestational Diabetes

Increase in serum uric acid levels prior to 24 weeks of gestation has been linked to risk of gestational diabetes (GDM) in an observational study recently published in the *Journal of Clinical Endocrinology and Metabolism*.[1]

Researchers retrospectively analyzed data of pregnant women with singleton pregnancies from February 2018 to June 2022 to investigate the association between serum uric acid levels before 24 weeks of gestation and subsequent odds of GDM and other adverse pregnancy outcomes.

Out of the 24,023 women included in the study, 3,204 (13.34%) developed GDM between 24 and 28 weeks of gestation. A strong association was observed between uric acid levels and risk of GDM, the primary outcome of the study. The relative risk for GDM was 1.43 among women with uric acid levels ranging from 240 to 300 μmol/L. The relative risk increased to 1.82 with rise in serum uric acid levels >300 μmol/L. A similar association was observed between serum uric levels and the secondary outcomes of the study, which were GDM type A2 requiring medication for optimal glycemic control, preterm birth and GDM combined with pre-eclampsia.

These findings show that detection of elevated uric acid levels before 24 weeks of gestation is associated with risk of GDM. The study further suggests that "the best time to test for uric acid is before 18 weeks of gestation". Hence, monitoring of uric acid levels in early pregnancy may identify women at risk of GDM allowing early intervention.

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