



Challenges of Management of Chronic Kidney Disease in a Single Centre in Southern Nigeria

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Abstract

Background: Chronic kidney disease (CKD) in children has an increasing incidence globally. Most children in developing countries present in End Stage Renal Disease (ESRD) where Renal Replacement Therapy (RRT) is required for survival. Late presentation, unavailability of donors and highly specialised teams for Renal transplantation, dialysis back up, poor physical and legal infrastructure and cultural bias against organ donation pose huge challenges to the management of CKD in Nigerian children.

Objectives: The aim is to highlight the challenges faced with the management of CKD in children in a tertiary centre in southern Nigeria.

Methods: A retrospective study in which data of all children managed for CKD in UUTH over a 10year period (January 2012- November 2021) was reviewed highlighting the stage of CKD at presentation and challenges encountered in the management of these patients.

Results: CKD accounted for 16% of the renal diseases (232) and 0.67% of all admissions (5787) into the children's ward during the study period. Seventy nine percent of the patients presented in stage 5 of the disease. Sixty seven percent of the CKD patients Left Against Medical Advice (LAMA), while 23% died. None of the patients had adequate dialysis or regular monitoring of biochemical parameters due to poor finances. Renal biopsy was not carried out in any CKD patient.

Conclusion: Late presentation, high cost of haemodialysis, lack of diagnostic facilities and nonavailability of Noncommunicable Diseases Prevention Programmes are the main challenges faced in this centre. Preventive measures, RRT subsidies and universal health insurance are recommended to reduce the prevalence and morbidities/mortalities of CKD.

Keywords: Challenges; Management; Chronic Kidney Disease; Children; Nigeria

Introduction

Chronic Kidney Disease (CKD) is a major cause of childhood morbidity and mortality [1]. It is a global public health concern [1-4]. In recent times, although CKD in children has gained a lot of attention especially with its increasing incidence, there is still a dearth in the availability of data in this population when compared to the adult population especially in developing countries [1,5-7]. This could be due to lack of national registries and surveys for kidney diseases, the historical absence of an earlier common definition and well defined classification of CKD in children and late presentation to health facilities [1]. While children in developed countries are seen in the earlier stages of the disease when management can be structured for better outcome, most children in developing countries present in End Stage renal Disease (ESRD) where renal replacement therapy (RRT) is required for survival [9]. Renal transplantation, a more cost effective RRT requires highly specialized teams, availability of donors, dialysis back up, physical and legal infrastructure with the additional barrier of cultural bias against organ donation [10].

Late presentation has been reported as a major problem faced in developing countries [11]. This is because the early stages of CKD are often asymptomatic and mostly underdiagnosed [1]. Therefore, these children are not seen in health facilities for proper management to slow the progression to ESRD. Moreover, the awareness of kidney diseases especially in children is strongly obscured by the continual focus on the prevention and treatment of communicable diseases [12].

The estimation of the causes of CKD in low- and middle-income countries (LMIC) remains difficult due to the lack of diagnostic facilities and trained health personnel. However, chronic glomerulopathy is the main reported cause of CKD in studies done in Asia, Latin America, Caribbean and Sub-Saharan Africa [13-16]. This is due to the high prevalence of bacterial, viral and parasitic infections that affect the kidney [1]. In contrast, Congenital Abnormalities of the Kidney and Urinary Tract (CAKUT) and hereditary nephropathies are mostly reported as the leading cause of CKD in children in the developed countries. These conditions have been known to have a slower progression to ESRD [1].

With most patients in developing countries presenting in ESRD, RRT therapy is needed for survival. However, approximately 80%

of RRT patients globally reside in Europe, Japan, north America, where all children in ESRD have access to RRT. In developing countries on the other hand, due to limited health resources and lack of trained personnel, RRT is rationed and only those that afford such care can sustain it [1]. Peritoneal dialysis (PD) though cheaper is underutilized in developing countries like Nigeria due to lack of materials like PD catheters, dialysis fluid, insufficient personnel to administer PD and financial constraint [17]. It has been documented that countries such as Japan, Turkey preferentially use PD even though in most countries CKD patients less than 20 years of age commence RRT with HD [18,19]. In a study done in Enugu Nigeria, only 12% had PD while 64% was managed conservatively [11].

The management of children with CKD in developing countries is therefore plagued with numerous challenges.

In this study we aimed at highlighting the challenges encountered in the management of these patients with the hope to add to the existing literature of CKD in children.

Methods

This was a retrospective study over a ten (10) year period January 2012 to November 2021. Data of all children managed for CKD was reviewed highlighting the stage of CKD at presentation, age, gender, socioeconomic status, probable diagnoses, type, and adequacy of RRT offered, laboratory support and outcome to determine the challenges encountered in the management of these patients in the Paediatric Nephrology unit in University of Uyo teaching Hospital (UUTH).

Chronic Kidney Disease was defined as kidney damage, structural or functional abnormality, imaging finding) for more than three (3) months or glomerular filtration rate (GFR), less than 60ml/min/1.73m² for > 3 months using the National Kidney Foundation's Kidney Disease Outcomes Quality Initiative (NKF-K/DOQI) [20]. CKD was classified into five (5) stages. In stage 1, there is kidney damage with normal or increased GFR (GFR >90 ml/min/1.73m²).

In stage 2, there is kidney damage with mild decrease in GFR (GFR 60-90ml/min/1.73m²). Stage 3, has moderate decrease in GFR (GFR 30-59ml/min/1.73m²). Stage 4, has severe decrease in GFR (GFR 15-19ml/min/1.73m²). In stage 5 also known as ESRD, there is kidney failure with GFR <15ml/min/1.73m². Estimated

GFR was calculated from the serum creatinine using the Schwartz formula [20,21]. Probable diagnosis was determined mainly from the clinical history of these patients. Socioeconomic status was determined using Oyedeji classification into classes I to V, class V being the lowest class [22].

Data set was extracted from the paediatric nephrology unit register and case notes of all children managed for CKD in UUTH over the study period. Data was entered into an Excel spread sheet. Codes were given to each case. Data were cross-checked and data cleaning were performed before data analysis.

The data was analyzed using STATA version 13. Categorical variables were summarized as frequencies and percentages while quantitative continuous data were summarized as mean and standard deviation. Association between categorical data was assessed with chi square test at a level of significance of $P < 0.05$. Data was presented in tables, charts, and graphs.

Ethical approval for this study was obtained from University of Uyo Teaching Hospital Institution Research and Ethical Committee. All patient identifiers like names, addresses, hospital number and other identifiers were omitted.

Results

CKD accounted for (16%) of all (232) paediatric renal diseases and 0.67% of the total (5787) admissions into the children’s ward during the study period. The prevalence of CKD was 13.5 per million children population. Male to female ratio was 1.2:1. Mean age at presentation was 14 ± 2 years. Majority of patients were of social class 5 (62%), closely followed by those in social class 4 (28%).

Thirty one (79%) of the patients presented in stage 5 of the disease (Figure 1).

Renal replacement therapy was offered to 35 (87%) of the patients. Haemodialysis was done for all patients on dialysis. None of the patients had adequate dialysis or regular monitoring of biochemical parameters due to poor finances. Renal biopsy was not done in any of the CKD patients (Figure 2).

Overall outcome showed that 26, (67%) Left Against Medical Advice (LAMA) due to financial constraint, 9,(23%) died and 2,

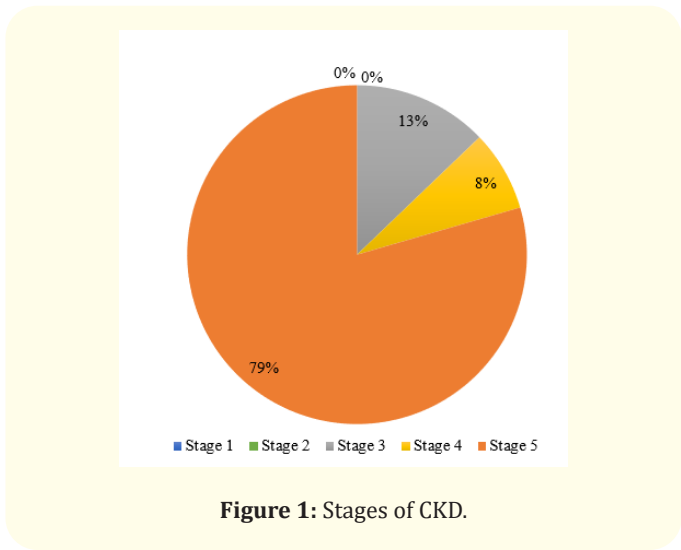


Figure 1: Stages of CKD.

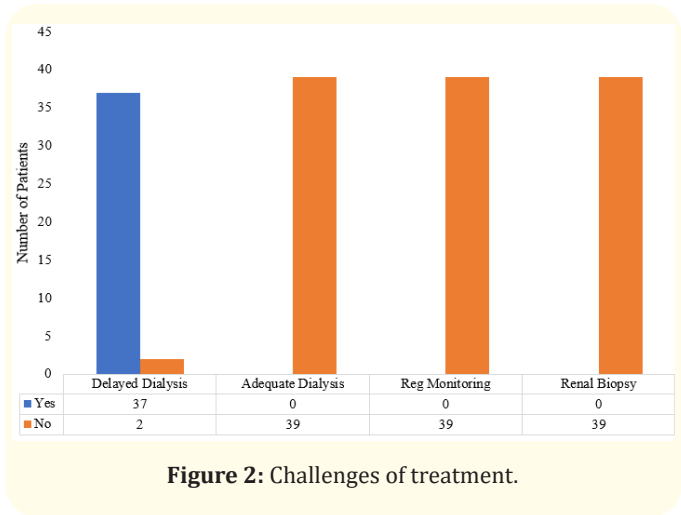


Figure 2: Challenges of treatment.

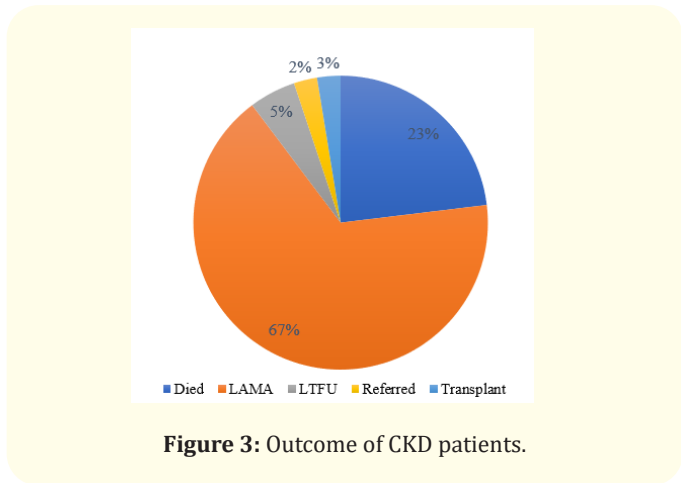


Figure 3: Outcome of CKD patients.

(5%) were Lost to Follow Up (LTFU). One patient referred to a specialist renal center had a transplant (Figure 3).

Discussion

Our study reported a prevalence of 13.5 per million children population. This is lower than reports from developed countries where earlier stages of CKD are reported, recognized, and documented [23-25]. This is higher than a report of 4 per million population in Benin, Nigeria [6]. All the patients in the Benin study had a GFR less than 25ml/min/1.73m² BSA. This prevalence is however similar to a reported prevalence of 14.9 per million children population in Enugu Nigeria using the same definition of CKD. Globally reports have reflected an upward trend in the cases of CKD threatening to reach epidemic levels in the next decade [26]. In relation to the number of renal diseases seen in our center during this study period, CKD accounted for 16%. This is higher than 11.1% of renal diseases reported in an earlier study [27]. The reason for the high prevalence in our study can be attributed to increased awareness of the condition and subsequent presentation to our health facility, liberal use of herbal concoction to treat childhood diseases and unrestrained purchase of over-the-counter medications to treat childhood illnesses in our environment. Moreso, our center is the only referral center in the state. A study in South Africa reported volume depletion and acute tubular necrosis as the major contributors to folk remedy Acute Renal Failure (ARF) [28].

Most of the patients in this study were > 10 years of age. This could be a reflection of the etiology mainly due to acquired causes such as chronic glomerular nephritis in the sub Saharan African region compared to congenital causes like CAKUT in developed countries [1,13-16,27].

Majority of patients with CKD in this study presented in Stage 5 of the disease similar to other reports in Nigeria [6,11] but in contrast to reports from Spain and Belgium with 82% in stages 2-3 and 67% in stage 3, respectively [24,25]. Earlier stages of CKD are mostly asymptomatic and thus may not be diagnosed and reported. Moreso, the late presentation in our study may be a reflection of the low SEC of most of our patients which in turn is a reflection of their health seeking behaviour. Also, cultural, and religious bias concerning the causes of renal diseases in children plays a significant role in late presentation to health facilities.

None of our patients had adequate RRT or laboratory support for biochemical monitoring due to financial constraints. The estimated monthly cost of HD in our center is about 150,000 Naira as compared to a national minimum wage of 30,000 Naira. Due to the focus on communicable diseases, the scarce resources are not channeled to preventive programs for non-communicable diseases such as CKD [11].

Our study however reported a lower mortality compared to other studies. This could be due to a higher proportion leaving against medical advice and a poor culture of follow-up.

Conclusion

CKD in children is on the increase globally. Late presentation coupled with low SEC and the high cost of RRT are major challenges in the management of these patients. With these in mind, focus should be on preventive programs and subsidies for RRT.

Conflict of Interest Statement

The authors have no conflicts of interest relevant to this article.

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