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Original Research Article

Prevalence of chronic kidney disease among the hypertensive patients in Wajir county, Kenya

Abdirahman M. Ali[1]*, Harun M. Kimani[1], Gordon O. Ogweno[2]

[1]Department of Family Medicine, Community Health and Epidemiology, [2]Department of Physiology, Kenyatta University, Nairobi, Kenya

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***Correspondence:**
Dr. Abdirahman M. Ali,
E-mail: abdimadobe114@gmail.com

ABSTRACT

Background: Chronic kidney disease (CKD) is public health burden and rising rapidly in prevalence in developing countries especially in Sub-Saharan Africa. CKD increases with advancing age and comorbidities like hypertension, diabetes and obesity. However, there is no data on CKD the prevalence and risk factors associated among the hypertensive adult patients in Wajir county. This study aimed at estimating the prevalence and establishing risk factors associated with CKD among hypertensive patients in Wajir county and sought to recommend viable preventive measures.
Methods: Analytical cross-sectional study design utilized, non-probability consecutive sampling was adopted to obtain sample size of 293 respondent attending medical outpatient clinic at Wajir county referral hospital between September to December 2023. The study utilised primary data that were collected using structured questionnaires and secondary data from the laboratory result.
Results: Key findings revealed majority of hypertensive patients have CKD (45.40%), highlighting a critical health concern in the region. The study found most CKD cases were in early stages (stages 1 and 2), some had progressed to severe stages (stages 4 and 5). Regression analysis identified several demographic and clinical factors associated with CKD development, including age, gender, and education, and employment status, family history of CKD and difficulty in medication compliance.
Conclusions: there is high prevalence of chronic kidney disease among hypertensive adults in Wajir county. With nearly half of hypertensive patients also suffering from CKD, there is an undeniable public health crisis at hand in Wajir county. Study recommended initiation of targeted screening programs.

Keywords: CKD, Hypertension, Prevalence

INTRODUCTION

Lifestyle disease is becoming the nightmare of the health system globally with its upward trend and overtaking the communicable diseases in relation to public health burden.[1] CKD is one of emergent non-communicable disease and it is of global public health concern with increasing incidence of patients requiring renal replacement therapy. It is defined as reduction of functional or structural capacity of the kidney evidence by glomerular filtration rate (GFR) less than 60 ml/minute per 1.73 m^2 for a period more than three months and it has resulted over a million deaths in the year 2017 becoming among top 15th cause of global mortality.[2] Hypertension affects almost one billion people globally and is one of the commonest causes of mortality. Hypertension is also second major cause of CKD.[3] Both CKD and hypertension have serious implication on modern day society due to transformation in the lifestyle that predispose to emerging diseases. Studies have found

timely diagnosis and appropriate management of kidney disease comorbid with diabetes and hypertension can slow or prevent progression into chronic kidney disease and it is economic friendly.[4]

Globally, non-communicable disease contributes 63% of the deaths with developing countries accounting for 80% of this mortality.[5] Modifiable risk factors such as hypertension, diabetes mellitus (DM), obesity and smoking are the main reason for increased rise in CKD prevalence. Studies report that the prevalence of CKD is 13.4% in general population.[6] While in another study on the prevalence of CKD in patients with hypertensive was 24.7% higher as compared to the general population.[7] About 1.2 million deaths due to CKD indicated rise of the condition by 98.02% with escalation of the burden due to hypertension happening very fast in developing countries than in the first world countries.[8] Worldwide, hypertension was reported among 1.4 billion adult populations with a prevalence of CKD reported to be 30% in United States among hypertension adult.[9] WHO report in 2018 accounted hypertension as the leading risk factor for CKD.[10]

In Sub Saharan Africa, CKD affects mainly young adults and is a substantial cause of death in the young adults.[11] The prevalence of CKD stands at 32.3% among hypertensive patients mainly from urban populations. Ghana prevalence is 46.9% among hypertensive population while Nigeria recorded 10.7%.[12] Study in Ethiopia by Hunegnaw et al reported 17.6% prevalence of CKD among adult hypertensive patients.[13] Long duration of hypertension and elevated systolic blood pressure (SBP) are the key risk factors linked to the incidences of CKD among hypertensive patients.[13,14] Hospital based study that was conducted in north western region of Tanzania, demonstrated that hypertension was number one cause of CKD.[15] There is inadequate data on general prevalence of CKD in Kenya. A research by Rotich et al in Kericho County estimated the prevalence of CKD at 0.41% in Kericho to a high of 10-26% based on the global estimates of CKD.[16] The Kenya STEPS survey 2015 reported no significant variation in DM and hypertension prevalence data in both rural and urban population. Determining the related risk features of CKD among hypertensive patients is paramount for prevention and control of CKD. In Wajir County, there is limited or no available data related to the prevalence and associated factors of this ailment, mainly among hypertensive patients. Therefore, this study aimed to assess the prevalence and associated risk factors of CKD among hypertensive patients attending Wajir county referral hospitals. The study findings may contribute towards prevention and control of the CKD.

METHODS

This study utilized analytical cross-sectional study design. The study participants were hypertensive patient attending medical outpatient clinic at Wajir county referral hospital, Wajir county. Non-probability consecutive sampling methods utilized and participant sampled to saturation. All research participants who met the inclusion criteria were recruited and gave both verbal and written informed consent. Prospectively, primary data obtained using structured questionnaire and secondary data obtained from the laboratory results. The study was conducted between September to December 2023 with respond of 293 of hypertensive participants.

Statistical analysis

All data collected was analysed using statistical package for social science software V.16.0 and data was presented in terms of tables and figures. Chi-square was utilized for observation of significance and a p value of ≤0.005 was considered to be statistically significant.

RESULTS

Questionnaires were administered to a total of 362 participant and only 293 were dully filled and returned, yielding a response rate of 81%. Socio-demographic characteristics of participant, the most significant age group affected by hypertension was those over 60 years old, making up 39.6%. However, majority were male (73.4%) of Islamic faith (90.4%) and married (89.1%). In terms of employment largely unemployed (37.2%). The findings show that majority of respondents had no formal education (38.2%).

Table 1: Sociodemographic characteristics.

Variables	Category	Frequency (n=293)	Percent
Age (years)	<40	64	21.9
	41-50	66	22.5
	51-6	47	16.0
	>60	116	39.6
Gender	Male	215	73.4
	Female	78	26.6
Religion	Islam	265	90.4
	Christian	28	9.6
Marital status	Single	22	7.5
	Married	261	89.1
	Widowed/ Separated/divorced	10	3.4
Education	No formal education	112	38.2
	Primary	93	31.7
	Secondary	69	23.5
	Tertiary/ post-secondary	19	6.6
Employment status	Unemployed	109	37.2
	Housewife	77	26.3
	Self-employed	69	23.5
	Formal employment	38	13.0

Prevalence of chronic kidney disease

The figure below shows the prevalence of CKD among the studied respondents. Result of the study shows that a significant proportion of the respondents (133, 45.4%) had CKD. Conversely, 160 (54.6%) of the respondents did not have CKD.

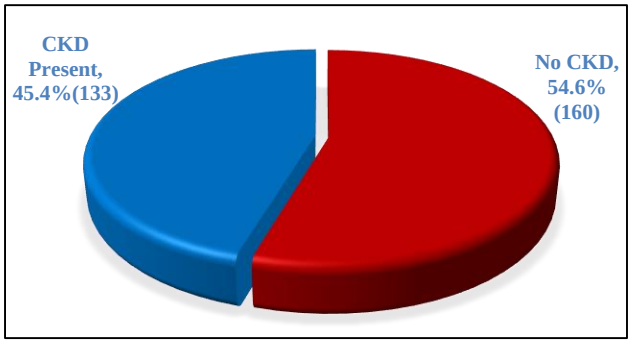

Figure 1: Prevalence of CKD.

Stages of CKD

The Table 2 shows prevalence of CKD as per stage. Majority were in stage 1 (54.6%) with stage 3a and 5 recording lowest number at 1.5%.

Table 2: Prevalence of CKD as per stages.

CKD stage	Frequency	Percentage
Stage 1	73	54.6
Stage 2	19	14.8
Stage 3a	2	1.5
Stage 3b	17	12.6
Stage 4	20	15.0
Stage 5/ESRD	2	1.5
Total	133	100

Association between demographic characteristics and development of CKD

The results in Table 3 show that there was a significant association between the age of hypertensive patients and the development of chronic kidney disease (CKD) in Wajir county. Specifically, the results show that patients aged between 51-60 years were more likely to develop CKD compared to those aged less than 40 years (OR=2.462, CI 2.623-44.612, p value <0.001). Gender of the respondent was also found to be significantly associated with the development of CKD. In this case, females were more likely to develop CKD than their male counterparts (OR=5.928, CI 0.401-0.921, p value <0.001).

Table 3: Association between demographic characteristics and development of CKD.

Variables	Category	OR	95% (CI)		P value
			Lower	Upper	
Age in years	<40	Ref			
	40-50	4.261	0.536	8.292	0.107
	51-60	2.462	2.623	44.612	<0.001
	>60	3.981	0.723	1.120	0.126
Gender	Male	Ref			
	Female	5.928	0.401	0.921	<0.001
Religion	Muslim	Ref			
	Christian	0.520	0.993	11.055	0.735
Marital status	Single	Ref			
	Married	0.328	2.201	8.921	<0.001
	Widowed/separated	0.917	0.291	1.027	1.032
Education	No formal education	Ref			
	Primary	0.790	0.243	11.119	0.116
	Secondary	0.625	0.511	1.103	0.073
	Tertiary	0.981	2.281	2.791	<0.001
Employment status	Unemployed	Ref			
	Housewife	0.705	0.511	1.989	0.231
	Self employed	0.620	0.453	1.119	0.104
	Formal employment	0.945	0.581	0.832	<0.001

Other variables such as education and employment status were also significantly associated with the development of CKD. The study found that patients with tertiary or post-secondary level of education were 0.981 times less likely to develop CKD compared to those with no formal education (OR=0.981, CI 2.281-2.791, p value <0.001). Additionally, those in formal employment were 0.945 times less likely to develop CKD compared to the

unemployed ones (OR=0.945, CI 0.581-0.832, p value<0.001).

DISCUSSION

The study conducted in Wajir county aimed to assess the prevalence of chronic kidney disease (CKD) among hypertensive patients, revealing a striking 45.4% prevalence rate, with a majority in stage 1 and only a few (1.5%) participants was on ESRD implying the slow progression of the disease, this finding is contrary to study conducted in Nigeria.[16] This underscores the need for targeted interventions beyond hypertension management. The high prevalence of CKD concurs with previous findings of study conducted in Kenya and Ethiopia indicating hypertension as a significant predictor of CKD.[17,18] The findings disagree with lower prevalence of CKD reported in study conducted in Kericho county. However, the target population was general population.[2]

Majority of the participant were elderly (>60 years) implying that hypertension is prevalent in this population and aging is also associated with decline of glomerular filtration rate hence elderly population are at more risk of developing kidney disease. This is consistent with previous study Kaze et al and contrary to study conducted in Ethiopia.[8,19]

Individuals with no formal education and those who were unemployed were more likely to develop the condition implying the literacy and financial ability could have influence individual health. These findings concur with the conclusion made by Moore et al.[20] The study found that a large majority of respondents were male (73.4%), suggesting that men were either more likely to be hypertensive, more likely to seek treatment, or both. The results further show that most respondents were of Islamic faith (87.0%) and were married (89.1%), which may have cultural or social implications for disease prevalence and treatment adherence.

CONCLUSION

Study aimed to determine the prevalence of CKD among hypertensive patient in Wajir county, Kenya. The finding of the study noted high prevalence of CKD among the study population echoing the need to establish early screening measure and more stringent control of hypertension.

Recommendations

Healthcare facilities within Wajir county should be designed to offer integrated services that cover both hypertension and CKD. These should include not just medication but also screening and educational programs that guide patients on importance of control of blood pressure. The healthcare staff should be trained to deliver these services seamlessly to offer a complete healthcare package to the patients.

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