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RESEARCH ARTICLE

Prevalence of chronic kidney disease amongst motor park workers in Yenagoa metropolis: World Kidney day 2023

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Background

Chronic Kidney Disease have been observed to be of increasing prevalence worldwide and its associated escalating cost of care and overall impact on health can be daunting especially in low- and middle-income earning populations in Sub Saharan Africa. Risk factors for this condition should be sorted out for in these populations.

Objective

This study was done to obtain the prevalence of CKD and the associated risk factors among motor park workers in Yenagoa metropolis, South – South Nigeria.

Method

One hundred and forty-four (144) subjects; motor park workers aged 18 years and above were recruited for the study via simple random sampling. History was obtained via interviewer – administered structured questionnaire, then subjects were evaluated for anthropometry, urinalysis, random blood glucose and serum creatinine. The outcome was analyzed via descriptive statistics using version 25.0 of statistical Package for Social Sciences (SPSS) software. Ethical consent was obtained from Ethical board, Federal Medical Centre Yenagoa.

Results

The study consisted of 102 males and 42 females. The mean age of the subjects was 45.1±12.4 years. The prevalence of CKD in the study was 11.1%. The prevalence of CKD was statistically significant across various age group. Though the most prevalent risk factor of CKD in this study was the use of herbal medications and obesity but the use of herbal medications and hypertension were the most associated risk factor for the development of CKD. Others identified risk factors include cigarette smoking and diabetes.

Conclusion

The study showed a high prevalence of CKD among motor park workers and use of herbal remedies and hypertension to be the most associated risk factor for the development of the disease in this study group. There is a need for health education to reduce the impact of CKD in this index as well as similar professions.

Introduction

Chronic kidney disease (CKD) is an impairment of kidney function for three months or more as defined by structural or functional abnormalities of the kidney such as urinary sediment abnormalities or protein uria with or without reduction in glomerular filtration rate, or estimated glomerular filtration rate (eGFR) of less than 60mls/min/1.73m^2 for three months or more with or without structural abnormalities.[1]

Chronic kidney disease is a leading cause of morbidity and mortality in the world.[2] It is an underrated cause of poverty and it hampers economic growth of many countries.[3] Eighty percent of chronic kidney disease deaths occur in low and middle-income countries.[3]

It is now recognized as a global public health problem, and its prevalence has increased recently in Sub-Saharan Africa.[4-5] While the disease magnitude has been better characterized in developed countries, increasing evidence shows that developing countries bear the greater burden. Chronic kidney disease and to a greater extent, end-stage renal disease contribute substantially to the burden of illness, disability and premature death across sex, age, race, socio-economic and geographic boundaries.[6]

The National Kidney Foundation estimates that 20 million Americans have chronic kidney disease and at least a further 20 million people have an increased risk.[7]The incidence of end-stage renal disease in United Kingdom is within the range of 100-200 per million population per year.[8]

In Nigeria, although accurate figures are not available, the size of the problem has been estimated using hospital admission records. In hospital based studies in the South west Nigeria, the frequency of CKD was found to range between 6.7 and 8.0%.[9-10]

Globally, the common risk factors for development of chronic kidney disease are hypertension, diabetes, hyperlipidemia, obesity and smoking but the pattern is slightly different in Sub-Saharan African countries where infection related causes still play significant role.[11]

According to an extensive review by Barsoum in 2006,[12] chronic glomerulonephritis and interstitial nephritis are the principal causes of CKD in Sub-Saharan Africa, reflecting the high prevalence of bacterial, viral and parasitic infections that affect the kidneys.[13]

Chronic glomerulonephritis and hypertension account for majority of CKD cases in Nigeria, with diabetes, obstructive Uropathy and autosomal dominant polycystic kidney disease accounting for smaller proportions.[14]

Studies of prevalence of CKD and its risk factors in yenagoa especially among the motor park workersis sparse; this study will provide such data.

Objectives of the Study

1. Prevalence of CKD among motor park workers in Yenagoa, Nigeria
2. Prevalence of risk factors of CKD among these study participants
3. Association between the presence of risk factor for CKD and development of CKD

Methodology

This is a cross sectional study of 144 consecutive subjects who are workers in Ekeki motor park Yenagoa.

These subjects had a relatively detailed clinical assessment(history and examination), Urinalysis, random blood glucose and creatinine. These clinical data were entered into a questionnaire.

Weight was measured in kilograms using an OceanMed precision weighing balance. Height was measured in metres using an Accu-Hite mechanical stadiometer with the subject standing with feet together. Body mass index(BMI) was calculated using weight/(height)^2.

Blood pressure was measured in millimeters of mercury(mmHg) in sitting position using vintage Accoson mercury sphygmomanometer to determine the brachial artery systolic and diastolic blood pressure using the 1st and 5th phases of Korotkoff sound respectively.

Urine sample was collected with universal container from each subject for dipstick to assess protein uria and blood. Random blood glucose was checked using Accu-chek glucometer. Serum creatinine was analyzed at the Federal medical Centre clinical chemistry laboratory.

The glomerular filtration rate (eGFR) was calculated using theChronic Kidney Disease Epidemiology Collaboration (CKD-EPI)

CKD-EPI eGFR = 141 x min(Scr/k, 1)^{a} x max(Scr/k, 1)$^{-1.209}$ x 0.993^{Age} x 1.159 (if black) x 1.018 (if female), where Scr is serum creatinine, k is 0.7 for females and 0.9 for males, a is -0.329 for females and -0.411 for males, min indicates the minimum of Scr/k or 1 and max indicates the maximum of Scr/k or 1.

Chronic kidney disease was defined in this study as eGFR less than 60ml/min/1.73m^{3}

Statistical Analysis

Data obtained were analyzed using a commercially available statistical data management software statistical package for social science package 25(SPSS-25)

Results were presented as mean±standard deviation for continuous variables and percentages for categorical variables. Tables were used to illustrate results where appropriate. Categorical variables were compared using chi-square while continuous variables were compared using students t-test. Risk factors associated with CKD were analyzed using logistic regression analysis(ODD RATIO). A value of less than 0.05 was considered statistically significant.

Results

Socio-demographic characteristics of the study participants

This study consisted of 102 males and 42 females. The age range of the subjects was 20-76 years with mean age of 45.1±12.4 years. The age and sex distribution of the subjects are shown in Table 1.

Thirty seven (25.7%) were single, 105(72.9%) were married while 2(1.4%) were widowed.

Seventeen (11.8%) had primary level of education, 53(36.8%) had secondary level of education while 74(51.4%) had tertiary level of education**.**

Prevalence of Ckd in the Study Participant

The prevalence of CKD in this study was 11.1%. Of this 12(75%) were male while 4 (25%) were female. Table 2
There was a statistical significant difference in the prevalence of CKD across various age group(p=0.017) and across various educational level (p=0.049) Table3

Table 1. Age and Sex Distribution of the Study Participants

Age group		Gender	
	Total N = 144 (%)	Male N = 102 (%)	Female N = 42 (%)
20 - 29 years	16 (11.1)	4 (3.9)	12 (28.6)
30 - 39 years	24 (16.7)	17 (16.7)	7 (16.7)
40 - 49 years	59 (41.0)	45 (44.1)	14 (33.3)
50 - 59 years	27 (18.8)	21 (20.6)	6 (14.3)
>60 years	18 (14.7)	3(7.1)	18 (12.5)

Table 2. Prevalence of Ckd among Study Participant

Study population	Frequency n=144	Percentage (%)
CKD	16	11.1
NO CKD	128	88.9
Presence of CKD	**n=16**	**(%)**
Male	12	75
Female	4	25

Table 3. Prevalence of Ckd by Sociodemographic Characteristic

Characteristics	Total N = 144	Renal status CKD N = 16 (%)	Renal status NO CKD N = 128 (%)	χ^2	P-VALUE
pex					
Male	102	12 (11.8)	90 (88.2)	0.15	0.697
Female	42	4 (9.5)	38 (90.5)		
Age Group					
20 - 29 years	16	1 (6.3)	15 (93.8)	2.05	0.017*
30 - 39 years	24	1 (4.2)	23 (95.8)		
40 - 49 years	59	4 (6.8)	55 (93.2)		
50 - 59 years	27	4 (14.8)	23 (85.2)		
>60 years	18	6 (33.3)	12 (66.7)		
Marital Status					
Single	37	2 (5.4)	35 (94.6)	2.00	0.369
Married	105	14 (13.3)	91 (86.7)		
Widow/widower	2	0 (0.0)	2 (100.0)		
Educational Level					
Primary Education	17	2 (11.8)	15 (88.2)	5.68	0.049*
Secondary Education	53	10 (18.9)	43 (81.1)		
Tertiary Education	74	4 (5.4)	70 (94.6)		

*Statistically significant

Table 4. Risk Factors for Ckd among Study Participants

Characteristics	Frequency N = 144	Percentage (%)
Social factors		
Cigarette Smoking	24	16.7
Number Pack Years – Mean ± SD	10.8 ± 10.3	
Chronic Medical Disorder		
Diabetes mellitus	10	6.9
Duration of Diabetes mellitus – Mean ± SD	3.7 ± 3.5	
Hypertension	22	15.3
Duration of Hypertension – Mean ± SD	4.0 ± 3.6	
Obesity	26	18.1
Proteinuria	3	2.1
Use of herbal remedies	28	19.4

Prevalence of Risk Factors of Ckd in the Study Participant

Use of herbal remedies was identified asthe most common risk factor of CKD in this study occurringin 28(19.4%) of the population. This is followed by obesity 26(18.1%) of the population. Other risk factors identified were cigarette smoking, hypertension, diabetes and proteinuria. Table 4

Association between the Presence of Risk Factors and Development of Ckd

There was a statistical significant in the comparison of the presence of CKD among participants who consumes herbal remedies and those who do not (p-0.009) and these participants have 3.9 odd of developing CKD (p-0.014)
Also hypertension was statistically significant for the development of CKD (p=0.001) and the odd of developing CKD in the presence of hypertension was 5.86(p=0.002). Table 5

Discussion

The study population was made up more male than female. This male preponderance in this study is consistent with findings of the work done in Benin by Onyemekeihia and Sanusi et al in Ife who reported higher number of males than female in their study.[15-16]The males are the breadwinners and by nature more likely to take up harder and more menial jobs like driving and other energy consuming jobs in the motor park than their female counterparts.

The mean age of the study population was 45.1±12.4 years, the economically active age group. This is similar to findings from other developing countries but contrasts with that seen in developed countries.[17-19]

Several factors may account for the younger age of the study participants. Younger people are stronger and more energetic to carry out various jobs around motor parks including driving and this gives more advantage more than their older colleagues in the same sector.

Also due to very high level of unemployment in the country, many young people have created other legitimate means of making money in order to take care of their both immediate and extended family and some of these means include driving and doing other smaller jobs around the motor parks**.**

The prevalence CKD in this study was high as reported by other studies in Nigeria.[15-16]

This high prevalence of CKD among this study population could be explain by increased use of herbal remedies and other nephrotoxic drugs possibly due to ignorance and lack of awareness. Also poor control of hypertension and diabetes due to poverty and lack of access to proper medical care could contribute to this.

There was a statistical significant difference in the prevalence of CKD across various age group, this reflects the contribution of increasing age in the development of CKD.

Also the development of CKD showed a significant difference across the educational levels of the study population, this shows that education plays a very major role in the prevalence of CKD.

The use of herbal remedies is the commonest risk factor of CKD in this study and this confers 3.96 times risk of development of CKD.

Also hypertension was found to be statistically significant for the development CKD and confers about 5.86 times risk of CKD.

This finding is slightly incontrast to work of Arogundade et al[5] that found hypertension, diabetes and glomerulonephritis as the major causes of CKD.

The reason for this finding could be due to increase use of herbal concoction and alternative medicine around Nigeria motor parks in particular and in yenagoa metropolis in general.

High level of poverty and ignorance among this group of people could be the reason for poor treatment of hypertension which eventually results to increase risk of CKD

Conclusion

a) The prevalence of CKD amongs motor park workers is high and it is common among males than females. Age and educational status plays a major in this high prevalence of CKD.

b) Use of herbal remedies and hypertension are the major contributing risk factors for the development of CKD in this population

Table 5. Association between the Presence of Risk Factors and Development of Ckd

Characteristics	Total N = 144	Renal status		χ^2 (p-Value)	Odd ratio (95%CI)	pValue
		CKD N = 16 (%)	NO CKD N = 128 (%)			
Body mass index						
Underweight	5	1 (20.0)	4 (80.0)	1.62 (0.806)	1.25 (0.06 – 26.87)	0.887
Normal weight	69	8 (11.6)	61 (88.4)		0.66 (0.07 – 6.35)	0.716
Overweight	44	4 (9.1)	40 (90.9)		0.50 (0.05 – 5.40)	0.568
Class 1 Obesity	20	2 (10.0)	18 (90.0)		0.55 (0.04 – 7.46)	0.657
Class 2 Obesity	6	1 (16.7)	5 (83.3)		1	
Smoking History						
Yes	24	3 (12.5)	21 (87.5)	0.06 (0.813)	1.18 (0.31 – 4.49)	0.813
No	120	13 (10.8)	107 (89.2)		1	
Use of herbal drugs						
Yes	28	7 (25.0)	21 (75.0)	6.79 (0.009*)	3.96 (1.33 – 11.82)	0.014*
No	116	9 (7.8)	107 (92.2)		1	
Hypertension						
No	122	9 (7.4)	113 (92.6)	11.27	5.86 (1.90 – 18.05)	0.002*
Yes	22	7 (31.8)	15 (68.2)	(0.001*)	1	
Diabetes mellitus						
Yes	10	2 (20.0)	8 (80.0)	0.86 (0.354)	2.14 (0.41 – 11.11)	0.364
No	134	14 (10.4)	120 (89.6)		1	
Proteinuria						
Yes	3	2 (12.5)	1 (87.5)	0.06 (0.813)	1.18 (0.31 – 4.49)	0.813
No	141	0 (10.8)	141 (89.2)		1	

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Conflicts of Interest

None

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