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Awareness of chronic kidney disease: a community survey in Ado Ekiti, South Western Nigeria

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ABSTRACT

Chronic kidney disease (CKD) is a growing public health problem worldwide. Awareness about the disease has been documented to lead to early recognition, prompt treatment and halt progression to end-stage renal disease (ESRD).

This study was carried out to determine the knowledge of CKD among inhabitants of Ado Ekiti, South Western Nigeria. Using a semi-structured questionnaire, the participants were interviewed during a public medical screening and scored on 13 items to determine their knowledge of anatomy, physiology, clinical features and treatment of CKD. The mean age of the participants was 36.04 ± 12.75years. A large proportion of the respondents 76.3% were able to identify correctly some functions of the kidney. The majority (78.4%) of the respondents have no idea about common symptoms associated with CKD. Few respondents knew that habitual use of NSAID and herbal concoction among others are potential causes of CKD. Overall, only 14.5% of the respondents had good knowledge about CKD. Among the respondents that had good knowledge, 31(11.0%) had tertiary education. We confirmed a lack of knowledge about CKD among our populace. It is recommended that the medical community and the government should borrow from the example of community sensitisation campaigns done for breast cancer and malaria to promote awareness about CKD.

Keywords: *Mass screening, awareness, Chronic kidney disease*

INTRODUCTION

Chronic kidney disease (CKD) is a common and growing public health problem worldwide. [1-4]

In most developing countries such as Nigeria, there is no adequate provision for the health needs of her populace and the patients solely bear the financial burden of treatment of chronic medical illness. The national health insurance scheme (NHIS) that was introduced by the federal government of Nigeria does not cover treatment of CKD.

With the rise in the position of kidney disease as a cause of premature death from position 32 in 1990 to position 24 in 2010[5], and the growing population of kidney disease patients, [6] attention should be focused toward the prevention and early detection of CKD.[7]

A global awareness campaign such as the World Kidney Day, aimed at raising awareness of the importance of the kidneys to the overall health of an individual is an important preventive strategy. It is estimated that more than 10% of the United States population have some evidence of kidney damage and/or reduced kidney function.[8] In Nigeria, various studies have reported the incidence of CKD to range between 1.6 and 12.4%. [9] However, the absence of renal registries has made it difficult to ascertain the true burden of CKD. The disease is also assuming an alarming proportion in sub-Saharan Africa (SSA), where the health systems are grossly under-developed and poverty is widespread; as CKD is a disease that disproportionately burdens ethnic minorities. [2, 10, 11]

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treatment; [2, 10] a move that may eventually reduce healthcare costs and halt progression to ESRD.[11] A survey by Okwuonu et al reported a low level of awareness of the functions of the kidney diseases among semi-urban dwellers in South East Nigeria. [12] A similar study of awareness was conducted by Okaka and her colleague among non-medical undergraduate students in a tertiary institution in Nigeria. Their findings revealed that knowledge of the causes of CKD was poor, as 44% of the participant were aware that diabetes mellitus is a cause of CKD and 25% knew of the association between CKD and hypertension.

Alebiosu reported a low awareness of the populace regarding the prevalence, causes, and prevention of kidney disease in a survey among non-medical hospital staff in a Nigerian tertiary hospital. [10] In view of the above, several guidelines and educational programmes have been designed aimed at curbing the epidemic and raise CKD awareness. [13-15]

OBJECTIVE

Given the high prevalence of CKD and its associated risk factors, this study was carried out to assess the level of awareness and knowledge of the populace about CKD in Ado Ekiti, South West Nigeria.

METHOD

A semi-structured questionnaire was administered to the participants during a public medical screening programme held at Ekiti State University Teaching Hospital, Ado-Ekiti, Nigeria. The healthcare personnel of the hospital were excluded from the study because of their presumed knowledge about CKD. The convenient sampling method used.

The questionnaire was developed based on a literature search of past CKD knowledge assessment studies. [4, 16, 17]. The content and face validity of the questionnaire was evaluated by two general practitioners and two nephrologists. Informed consent was obtained from the participants.

The participants were interviewed and scored on 13 items drawn from four basic sections as follows; anatomy and function of the kidneys, aetiology of CKD, symptoms and treatment of CKD. Questions were also asked about socio-demography and personal health. Each correct answer was scored 1 and the incorrect and un-answered questions were scored 0 with a total maximum score of 13. The summation of each participant scores was used to calculate the overall knowledge score as follows; poor knowledge 0-4, some knowledge 5-9 and good knowledge 10-13 scores.

SAMPLE SIZE

The sample size estimation was determined using the appropriate formulae.[18] A previous and similar study conducted by Alebiosu CO among non-medical hospital staff in a Nigerian tertiary hospital [10] showed that 16.4% have poor knowledge about the complaints of the kidney disease. The sample size in this study was extrapolated from this value at a 95% confidence level with a 5% margin of error and also allowing for possible responders.

STUDY SETTING

Ado-Ekiti is located in Ekiti State, in the South-Western geopolitical zone of Nigeria. The population of Ado city is 308,621 and accounts for about 12.9% of the estimated population of Ekiti state (2,384,212).[19] The state has four other adjoining states being serviced partly by the hospital**.** The inhabitants are indigenous Yoruba tribes while minority tribes include Igbos, Hausa and other ethnic groups. The people are mainly farmers, civil servants, traders, students and artisans.

DATA ANALYSIS

Data obtained was analysed with SPSS® version 16 (SPSS Inc, Chicago Illinois, USA.) computer software package. The mean ± standard deviation (SD) was computed for the quantitative variables. Frequency and percentage were generated for qualitative variables. Comparison between knowledge level and other variables was analysed with independence T-test. A one-way between-groups analysis of variance (ANOVA) was conducted to explore the impact of age on knowledge levels of CKD. Subjects were divided into three groups according to their age (group 1; 39 years or less; group 2; 40 to 60 years; group 3: 61 years and above). A P-value of d" 0.05 was taken as statistically significant.

RESULTS

Of the 325 administered questionnaires, 283 were good enough for analysis. The mean age of the participants was 36.04 ± 12.75 years, 164 (58%) were married and 144 (50.9%) were males (Table I). One hundred and eighty-eight (66.4%) had tertiary education and the majority of the respondents (65.7%) were in the age group 16-39 years (Table I). Eleven (3.9%) respondents reported a family history of CKD.

The Majority of the respondents 238 (84.1%) were able to identify the location of the kidneys, while 216 (76.3%) knew that an individual had two kidneys. A high proportion (76.3%) were able to identify correctly some functions of the kidney. Less than half of the respondents (42.0%) believed that CKD is common. More than two third (78.4%) of the respondents had no idea of common symptoms associated with CKD, while 0.4% of the respondents reported jaundice as a complaint of CKD (Fig 1). Although a large proportion of the respondents 146 (51.6%) believed that CKD can affect all age groups. A third (35.3%) were of the opinion that CKD is a disease of the adult only while about half (53.7%) believed that male and female sex are affected equally. Herbal medication use was believed to be a cause of kidney failure in only 30.4% of the respondents, while 248 (87.6%) respondents did not know that habitual use of nonsteroidal anti-inflammatory drug (NSAID) pain reliever can cause kidney failure.

There is a poor knowledge about the various treatment options available for CKD. Only 37 (13.1%) and 62 (21.9%) were aware of dialysis and kidney transplantation respectively. Five (1.8%) respondent believed that CKD can be treated by traditional method while 26 (9.2%) of the respondents were of the opinion that it is not treatable.

Overall in this survey, few respondents 41 (14.5%) had good knowledge of CKD while majority 186 (65.7%) and 56 (19.8%) had some and poor knowledge about CKD respectively. Among the respondents that had good knowledge, 31 (11.0%) had tertiary education, while 7 (2.5%) had secondary education and 2 (0.7%) had primary education (Table II). There is no significant difference in the mean knowledge score among the participants who had attained tertiary education and others who did not, 1.53 (95% confidence interval, CI: 0.78-2.28).

An independent-sample t-test was conducted to compare the knowledge scores for males and females. There was no significant difference in mean scores for males and females 6.63 ± 3.056 versus 6.54 ± 2.59, $t(281) = 0.25$, $P > 0.05$. There was no statistically significant difference in the mean knowledge scores for the three age groups [$F(2, 280) = 2.8$, $P = 0.07$].

TABLE I: Socio-demographic characteristic of the participants

Variables		No (%)
Sex	Male	144(50.9)
	Female	139(49.1)
Age group in years	16-39	
	40-60	
	≥ 60	
Educational Level	No formal education	10(3.5)
	Primary	21(7.4)
	Secondary	64(22.7)
	Tertiary	188(66.4)
Marital status	Single	111(39.2)
	Married	164(58.0)
	Widow/er	5(1.7)
	Separated	1(0.4)
	Divorced	2(0.7)

The poor attitude to routine medical check-up among the respondents was also shown in this study as more than half of the participants (54.4%) have never checked their blood sugar, while 63 (22.3%) had their blood pressure checked for the first time during this screening exercise.

About an equal proportion of respondents believed that hypertension (44.5%) and diabetes (42.4%) can cause CKD (Table III). There was a statistically significant difference in the mean knowledge score among the hypertensive self-reporter and participants who were not hypertensive. [F (2, 262) = 5.22, p = 0.04]. Albeit only 15 (27.3%) of the hypertensive self-reporters had poor knowledge about CKD (Table IV).

Among the respondents, 15.5% (often), 52.7% (occasionally) and 31.8 % (never) ingest herbal concoctions. Similarly, about 18.7% of the respondents habitually use NSAID pain reliever.

TABLE II: Level of awareness and educational attainment among the participants.

Educational level	Awareness level			Total
	Poor n(%)	Some n(%)	Good n(%)	
No formal education	1(0.4)	8(2.8)	1(0.4)	10
Primary school	7(2.5)	12(4.2)	2(0.7)	21
Secondary school	13(4.5)	44(15.5)	7(2.5)	64
Tertiary education	35(12.4)	122(43.1)	31(11.0)	188

TABLE III: Assessment of level of awareness of chronic kidney disease

Variables	Responses (%)		
	Yes	No	Don't know
Do you know that abuse of pain reliever drugs can cause kidney failure?	85(30.0)	124(43.8)	74(26.1)
Do you know herbal medicine can cause kidney failure?	86(30.4)	72(25.4)	125(44.2)
Do you know that Diabetes Mellitus can cause kidney failure?	120(42.4)	25(8.8)	138(48.8)
Do you know that high blood pressure can cause kidney failure?	126(44.5)	16(5.7)	141(49.8)
Do you consider kidney disease as an important medical problem?	226(79.9)	33(11.7)	24(8.5)
Do you think kidney disease is preventable?	214(75.6)	42(14.8)	27(9.5)
Do you believe that kidney disease is a common medical disease	119(42)	73(25.8)	91(32.2)

TABLE IV: CKD awareness among hypertensive, diabetes and status un-unaware participants.

Status of Respondent	Awareness level			Total
	Poor n(%)	Some n(%)	Good n(%)	
Hypertensive status				
HBP self-report	15(27.3)	30(54.5)	10(10.0)	55
HBP not reported	38(18.2)	143(68.4)	28(13.4)	209
HBP status un-aware	3(18.2)	13(68.4)	3(15.8)	19
Diabetes status				
DM self-report	4(33.3)	3(25.0)	5(41.7)	12
DM not reported	49(20.1)	165(67.6)	30(12.3)	244
DM status un-aware	3(11.1)	18(66.7)	6(22.2)	27

DISCUSSION

This study demonstrated that the awareness of CKD in our community is still unacceptably low, as only 14.5% of our respondents had good knowledge of kidney disease. Less than half of the respondents believed that kidney disease is common and a growing medical problem. More than 75% of our participants did not know common symptoms of CKD or the causes of kidney disease. This finding is consistent with the result of a study by Chow et al [17] where 51.3% of their respondents could correctly identify the risk factors for development of CKD.

Common causes of CKD in our environments such as infections, habitual ingestion of herbals medicine, NSAID as well as use of mercurial containing bleaching cream and soap were least mentioned by our respondents. [20, 21]

Findings from the work by Okaka E [16] and Alebiosu CO [10] have shown the consistent poor knowledge about causes of CKD among the general populace.

A study carried out in Australia among diabetic patients showed that few identified diabetes (8.6%) and hypertension (2.8%) as risk factors for development of kidney disease in response to an open-ended question on risk factors.[22] Okaka EI and Ojogwu LI [16] showed poor awareness of kidney diseases among non- medical students in Benin City Nigeria where 25% knew of the association between kidney disease and hypertension while 44% of the respondents were aware that diabetes mellitus is a cause of kidney disease, this is comparable to 42.4% obtained in our study.

While exploring the impact of education on the knowledge of chronic medical disease, we found that majority (75.6%) with good knowledge of CKD were those that had tertiary education.

This result is similar to the finding of Chow et al [17] who demonstrated the relevance of education in the knowledge of CKD. Tuot et al [23] also showed that low income and low levels of formal education were independently associated with low CKD awareness in addition to a greater burden of abnormal markers of CKD. It is assumed that an educated individual will be better informed, health literate, will be more attentive to the presence of disease and practice preventive behaviours as compared with less educated person. Fezeu et al [24] demonstrated that educational level has a direct influence on the extent of knowledge of chronic medical disease such as diabetes. Reports from other studies have equally shown the importance of education among other factors in the awareness of chronic medical disorder. [25, 26] A survey by Ayotte et al [27] on knowledge of hypertension among American general population showed that; ethnicity, gender and education level were found to be associated with knowledge levels. However, Plantinga et al. found no relationship between the level of education and awareness of CKD. [28]

A family history of CKD is expected to increase individual's knowledge about kidney disease and their desire to get tested [29] but we found the awareness among respondents with family history of CKD to be too low. Some of the family members in our environment render financial support to patients with chronic medical conditions and also accompanying them to the hospital during admission and clinic follow-up. This service by the family members provide an opportunity to interact with health personnel as well as sharing of beneficial health information.

Hypertension and diabetes mellitus are strong risk factors for development of CKD. [30] We found a poor attitude to regular medical check-up among the respondents (79.2%) generally and more worrisome among the hypertensive and diabetic individuals. Few (18.2%), among the hypertensive respondents have good level of knowledge about the association between high blood pressure and CKD, while less than one-third of them had blood pressure checked in the previous six months. These are high-risk individuals with a likelihood of poor compliance with antihypertensive medications. This finding is similar with previous reports by Petrella et al [31] where hypertensive patients were found to be unaware of the association of high blood pressure and CKD. In addition, they were found to have poor knowledge of lifestyle measures in the control of hypertension. Similarly, the report of a survey among hypertensive patients by Boulware et al showed that few (20%) felt "very likely" to develop CKD and one-third (33%) were "very concerned" about developing CKD. [32]

The use and exposure to nephrotoxins such as herbal preparations and habitual ingestion of NSAID were found to be common among the respondents. Undefined mixtures of herbal concoctions are particularly toxic to the kidney. The use of such nephrotoxic herbs are common in our environment and can present with various forms of renal dysfunction. [21, 33, 34]

LIMITATIONS

Our study has some limitations. The parameters and the cut-offs used to define knowledge level of CKD were not extreme enough in this study. However, future research can be directed on how a better measurement can be utilised in assessing population awareness and knowledge of chronic kidney disease. The result obtained in this study may not be representative of the population because of the sampling method used.

CONCLUSION

Our study further confirmed poor knowledge about CKD among our populace. We recommend that stakeholders in the medical community and government should follow the example of community campaigns as done for other communicable diseases like Tuberculosis, human deficiency virus (HIV) and malaria to promote awareness about CKD.

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