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Relationship Between Periodontal and Chronic Kidney Diseases- Opinions and Oral Health Practices of Nigerian Nephrologists

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ABSTRACT

Background: Chronic kidney disease (CKD) is a global public health issue with hypertension and diabetes being the leading risk factors. Recent studies have demonstrated a bilateral link between

Obiectives: To determine PD knowledge, attitudes.

Methods: This was a cross-sectional study in which 120 questionnaires were sent to Nephrologists and Nephrology trainees in Nigeria via their electronic mail between March and August 2015. The questionnaires had sections on socio-demography, knowledge of PD, PD link with CKD and other

Results: Fifty three nephrologists and trainees responded. Mean age was 38.7 ± 8.1 years with 41.5% in consultant cadre. About half (52.8%) had 1-5 years of clinical experience in nephrology. Oral health information was mostly from social media (52.8%) and the press (52.8%). Over 60% were knowledgeable about PD with positive attitudes towards periodontal care, but less than 50% knew PD to be a risk factor for CKD and poor glycemic control. Oral hygiene practices were unsatisfactory. Only 3.8% referred their patients with CKD to dentists

CKD patients' oral cavity for signs of PD.

Conclusions: This study has highlighted good PD knowledge and positive attitudes among nephrologists in Nigeria. However, knowledge of PD as a risk factor for CKD and poor glycemic control, oral hygiene and dental referral practices still fall short of expectation and hence needs to be improved upon.

Keywords: *Periodontal disease, CKD, knowledge, practices, nephrologists*

INTRODUCTION

Chronic kidney disease (CKD) is fast becoming a public health issue both globally and in Nigeria. The estimated prevalence is 8–16% worldwide, [1] with an incidence of 1.6% - 12.4% in Nigeria[2-4]. In developing countries such as Nigeria, it has severe implications on economic output.[5] Globally, CKD represents the 12th leading cause of death and 17th leading cause of disability.[6] However, the treatment

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of CKD is unaffordable to several people in Nigeria largely because of out-of-pocket mode of payment. The leading causes and traditional risk factors for end stage renal disease (ESRD) are hypertension and diabetes mellitus [7]. More recently however, other non-traditional risk factors such as periodontal disease have been reported as being contributors to CKD [8, 9]. Periodontal disease has a high prevalence of over 90% in Nigeria according to a national periodontal survey [10]. Epidemiological studies have demonstrated an association between periodontal disease and CKD [11, 12]. The rationale is based on evidence implicating periodontal disease, particularly periodontitis as a source of chronic systemic inflammation by dental plaque organisms and the elevation of inflammatory markers such as C-reactive protein in ESRD patients. The review by Wahid *et al*,[13] demonstrated a higher prevalence of periodontal disease in CKD patients while non-surgical periodontal therapy was shown to decrease the systemic inflammatory burden particularly in those undergoing hemodialysis therapy.

In view of these findings, there is a need for the kidney care physicians attending to CKD patients to keep up with the current trend in CKD pathology and be well armed with the relevant information pertaining to periodontal disease and how it affects their CKD patients. This would be of utmost benefit in resource limited hospital settings in Nigeria, where the morbidity and mortality associated with CKD is high due to unaffordability of regular dialysis and poor access to renal replacement therapy. It is however not certain how often Nephrologists and their trainees in Nigeria perform oral assessment on their CKD patients and how regularly such patients are referred to dentists for routine checkup.

Although, some recent studies have reported physicians' knowledge of PD and systemic interactions amongst medical doctors, [14, 15] no study has reported the opinions and oral hygiene and referral practice patterns of physicians involved in the care of CKD patients in Nigeria. The present study was aimed at exploring the views of kidney care physicians about PD, how it affects CKD and their referral practices to dentists with the end point of improving their patients overall management.

MATERIALS AND METHODS

The study was cross-sectional by design and was conducted among Nephrologists and nephrology trainees in Nigeria. The questionnaire was a modified version from another study [16]. Ethical approval was obtained from the Health Research Committee of the Lagos University Teaching Hospital before commencing the study. Data was obtained through the use of self-administered questionnaires modified from a previous study. The questionnaires were distributed to the participants electronically via their email addresses through Google drive. A purposive sampling method was used. The questionnaire had five sections.

Section A assessed their socio-demographic information and number of years of clinical experience. Section B documented their information on their knowledge of periodontal disease Also included in the survey were questions testing their knowledge of the relationship between the severity of periodontal disease and systemic illnesses/habits including, ESRD, diabetes mellitus and smoking. Three additional questions assessed sought the opinion of the doctors on PD as a risk factor for CKD, poor glycemic control and cardiovascular disease.

Section C evaluated their attitude towards periodontal health care through response to questions on their willingness to receive further education about PD and the need for greater collaboration between nephrologists and dentists amongst others. The questions on the attitude of the doctors were on a 5-point Likert scale with response alternatives ranging from "strongly agree" to ''strongly disagree". Section D and E recorded the respondents' oral hygiene practices and referral practice patterns of their CKD patients to dentists.

Data was analyzed using Epi Info™ 7 Software by Centers for Disease Control and Prevention (CDC). The continuous variable (age) was presented as means and standard deviation, while discreet variables (i.e. knowledge, attitude, practices) were reported as frequencies and percentages.

RESULTS

Socio-demography of Nephrologists

Of the 120 questionnaires originally sent out to nephrologists and nephrology trainees by emails, 53

questionnaires were filled and returned. (response rate of 44.2%). [Table 1]

Table 1: Socio-demography of Nephrologists

Characteristics	n	(%)
Mean age in years (SD)	38.7	(8.1)
Gender		
Male	34	(64.2)
Female	19	(35.8)
Professional Category		
Consultant Nephrologist	22	(41.5)
Senior Registrar (Nephrology)	15	(28.3)
Medical officer in training	12	(22.7)
Registrar	4	(7.5)
Work Institution		
Public alone	40	(75.5)
Both Public & Private	8	(15.1)
Private alone	5	(9.4)
Zone of location of work institution		
South-West	38	(71.7)
South-South	6	(11.3)
North-West	4	(7.6)
South-East	4	(7.6)
North-Central	1	(1.8)
Years of Clinical experience		
1-5 years	28	(52.8)
6-10 years	13	(24.5)
> 15 years	7	(13.2)
11-15 years	5	(9.4)
Average number of CKD patients seen weekly		
1-10	25	(48.1)
11-20	11	(21.2)
>20	16	(30.7)

CKD-Chronic Kidney Disease

Opinions and Attitude of Nephrologists about PD and CKD

Majority of the nephrologists and nephrology trainees gave correct answers to the questions on periodontal disease knowledge; definition (75.5%), etiology (62.3%) and clinical signs/symptoms (71.7%) as shown in Table 2. The knowledge on the PD epidemiology was poor as 32.1% answered correctly. Their knowledge of PD as a risk factor for CKD (45.1%) and poor glycemic control (43.1%) was poor, but good for cardiovascular disease (82.4%). Figure 1 shows their sources of oral health information. The doctors had a positive attitude towards periodontal health care as shown in Table 3.

Oral Hygiene and Referral Practices of Nephrologists

In Table 4, over more than 90% of the doctors used toothbrush and fluoridated toothpaste to clean their teeth, which was done twice a day by nearly two thirds (63.5%). Dental floss was used by only 7.8% of the doctors, while 19% had done scaling and polishing treatment 6-12 months previously. Table 5 reveals that only 3.8% of the doctors referred their CKD patients to the dentist on a regular basis, and the major reason prompting the referral was due to a dental complaint by the patient. About half (51.9%) had never examined their CKD patients' oral cavity for signs of periodontal disease.

DISCUSSION

Physicians involved in the care of patients with CKD need to be conversant with recent information regarding the role of periodontal disease in the management of these patients so as to optimize treatment outcomes. The present study among the nephrologists and their trainees found most of them to be quite knowledgeable about PD, the effect of ESRD and DM on the severity of PD. They also had a positive attitude towards their patients' periodontal health. However, they seemed to lack adequate knowledge of PD as a risk factor for CKD and poor glycemic control and were deficient in some important oral hygiene practices. They also had poor referral practices to the dentist. However, these findings should be interpreted with some caution due to the relative small sample size as a result of the low response rate of the doctors. Nevertheless, it has given some useful insight on the doctors' perspectives concerning PD and CKD interactions.is still much debatable [13]. Whilst some studies found no significant association between PD and CKD progression, [23, 24] periodontitis was reported to be prevalent, severe and under recognized in patients with renal failure[25]. Additionally, severe periodontitis was associated with low serum albumin in CKD patients on hemodialysis therapy,[26] as well

Table 2: Opinions of Nephrologists about Periodontal disease (PD)

Correct responses to questions assessing PD knowledge		n	(%)
PD is the same as gum disease		40	(75.5)
PD is mainly caused by plaque		33	(62.3)
Common symptoms of PD are gum bleeding, pocket formation & tooth mobility		38	(71.7)
PD is best prevented by twice daily tooth brushing & fluoride paste & daily dental flossing		34	(64.2)
PD affects about 90% of Nigerians		17	(32.1)
Severity of PD may be increased by end stage renal disease	(n=42)	33	(78.6)
Severity of PD may be increased by diabetes mellitus	(n=42)	39	(92.6)
Severity of PD may be increased by smoking	(n=42)	41	(97.6)
PD is a risk factor for chronic kidney disease	(n=51)	23	(45.1)
PD is a risk factor for poor glycemic control	(n=51)	22	(43.1)
PD is a risk factor for cardiovascular disease	(n=51)	42	(82.4)

Table 3: Attitude of Nephrologists towards periodontal care

Questions assessing attitude towards periodontal health care	SA		A		Neutral		D		SD	
	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)
It is important for me to know about periodontal disease	22	(41.5)	28	(52.8)	3	(5.7)	0	(0)	0	(0)
I am willing to receive further education about periodontal disease	24	(45.3)	24	(45.3)	5	(9.4)	0	(0)	0	(0)
I am willing to practice periodontal health promotion activities among my patients	18	(33.9)	32	(60.4)	3	(5.7)	0	(0)	0	(0)
Dental check-up should be a standard protocol for patients with CKD	15	(28.3)	27	(50.9)	11	(20.8)	0	(0)	0	(0)
There is a need for greater collaboration between Nephrologists and Dentists	15	(28.3)	25	(47.2)	12	(22.6)	1	(1.9)	0	(0)

SA- Strongly Disagree A- Agree D- Disagree SD- Strongly disagree

as in overt nephropathy and ESRD in individuals with type 2 diabetes [8]. In view of some of these reports, our findings raises some concerns because of the possible adverse effect periodontitis may have on the CKD patients' overall health status. On the contrary, the knowledge of PD as a risk factor for poor glycemic control is well established in literature.[23-25] More doctors would have benefited from other scientific sources of knowledge such as workshops and seminars organized on link between PD-and CKD. These sources of information were among the least selected by the doctors in this study.

Table 4: Oral hygiene practices of Nephrologists

Oral hygiene practices	n	(%)
Tooth cleaning aid used		
Tooth brush & fluoridated toothpaste	47	(88.7)
Tooth brush & any toothpaste	4	(7.5)
Tooth brush & fluoridated toothpaste & Chewing stick	2	(3.8)
Frequency & Timing of tooth cleaning(n=52)		
Morning before/after breakfast & night (bedtime)	33	(63.5)
Morning	19	(36.5)
Use of dental floss (n=51)		
No	23	(45.1)
Yes, occasionally	19	(37.3)
Yes, 3-4 times weekly	5	(9.8)
Yes, everyday	4	(7.8)
History of dental visit (n=52)		
1-2 years ago	25	(48.1)
Never visited	10	(19.2)
Within 6-12 months ago	17	(32.7)
Last scaling and polishing treatment (n=52)		
>1 year ago	23	(44.2)
Never	19	(36.6)
Within 6-12 months ago	10	(19.2)

It is also important to emphasize the need for better collaboration between medicine and dentistry specialties to encourage adequate dissemination of knowledge that is relevant which could be beneficial to CKD patients' overall care. The desire for such collaborations was expressed by the participants in this study. The low proportion of doctors who regularly examined their patients' oral cavity for PD was due largely to their perception that it was not necessary and even unsure of what signs to look at for. Although, their positive attitude to periodontal health was quite impressive, there was clearly an obvious gap translating their positive attitudes into effective action when it came to their oral hygiene and referral practices of their CKD patients on a regular basis. This was also the observation in the Brazilian study.[16]

More recently, an expanded role has been advocated for physicians in the oral health of adults, considering the novel link between oral, particularly periodontal disease and several systemic illnesses.[27] According to the 2011 Institute of Medicine report Advancing Oral Health in America it is an effort directed to minimize oral health disparities [28] and ensure better integration and coordination between medicine and dentistry.[27] Health care professionals including nephrologists ought to collaborate with dentists and be involved in the promotion of oral health among their patients. The positive attitudes shown

Table 5: Dental referral practices of Nephrologists

Dental referral practices	n	(%)
Frequency of referring CKD patients to the dentist (n=52)		
Occasionally	29	(55.8)
Never	21	(40.4)
Regularly	2	(3.8)
What would prompt referral of CKD patient to the dentist? (n=48)		
Patient with a dental complaint/On patient's request	36	(75.0)
Patient with signs of periodontal disease	12	(25.0)
Examination of oral cavity for signs of periodontal disease (n=52)		
Never	27	(51.9)
Occasionally	23	(44.2)
Frequently	2	(3.9)
Reasons for not examining the oral cavity regularly (n=50)		
Do not think it is really necessary	22	(44.0)
Do not know what to look out for	20	(40.0)
Do not have the time	8	(16.0)

CKD: Chronic Kidney Disease

by the nephrologists in this study by their willingness to practice periodontal health promotion activities suggests that with proper training on oral/periodontal disease, they are more likely to examine their patients' oral cavity. There is clearly a need for further training for the nephrologists in Nigeria to be able to detect PD early and ensure prompt referral to dentists. These doctors also need motivation regarding their own oral self-care practices.

Our study is a fair representation of nephrologists in Nigeria as different institutions from most geopolitical zones were represented which is one of the strength of this study. The limitation of the study however, lies in the relatively small sample of the doctors studied due to the low response rate which may have afforded some bias in the study. The authors however are hopeful that this study would stimulate some interest among nephrologists and their trainees on the desire to be more versatile in the field of dentistry and periodontology in particular.

CONCLUSION AND RECOMMENDATIONS

This study has highlighted good PD knowledge and positive attitudes among nephrologists in Nigeria. However, knowledge of PD as a risk factor for CKD and poor glycemic control, oral hygiene and dental referral practices still fall short of expectation and hence needs to be improved upon.

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