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Prevalence of Dental Disease and Risk to Oral Health in Oke-Ogun Rural Communities

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Abstract

The importance of oral health and the general health of an individual are interwoven such that if the oral health is poor, the general health would also be poor. There has been an increase in the interest of researchers in the state of the oral health because of the deleterious effects a poor oral health can have on the general health. While the prevalence of oral diseases has been reported to be on the increase worldwide, this paper presents a report on the prevalence of oral diseases in 10 rural communities known as Oke-ogun communities in Oyo State of Nigeria. Cleft and Facial Deformity Foundation (CFDF), an indigenous non-governmental organization (NGO) organized an outreach program, with permission from the State Health Ministry, to examine, diagnose dental diseases, and carry out free surgeries for patients in the visited communities. The program was for two weeks and was divided in phases with the first phase done in May 2019 and second phase in September 2019. Among 1396 respondents, 43.6% complained of toothaches with more female than male presenting with that complain. Also, 511 (36.6%) were reported to have gingivitis and 51 (3.7%) had dental caries. Furthermore, gingivitis and chronic periodontitis were more common in males 776 (55.6%) than females 620 (44.4%) and this was statistically significant at ≤0.002. Periodontal disease was found to be more prevalent in Oke-ogun communities in Oyo state, and this called for urgent intervention strategies by the federal government of Nigeria, non-governmental organizations (NGO) and the international organizations like the World Health Organization (WHO) since the poor oral health would eventually translate to poor general health.

Keywords

Dental Diseases, Oke-Ogun, Oral, Rural

1. Introduction

The relationship between oral health and general health is multidimensional such that the state of the oral health of an individual could either improve his general health and wellbeing or negatively affect it [1]. A new definition of oral health has been developed by the Federation Dentaire Internationale (FDI) and presented with "a companion framework" which was established to clearly show the intricate relationship among the three main foundations of oral health which are: "a) the disease and condition status; b) physiological function, and c) psychosocial function" [2]. This framework for oral health definition demonstrates that a combination of the determinants of oral health with moderating factors defines the overall health and well-being of an individual [2]. Therefore, a good oral health would translate to a good general health and better quality of life of an individual [3].

Oral health diseases were reported to have affected 3.9 billion people globally in 2010 with untreated dental caries being the most prevalent [4]. A report from Asia indicated that dental caries on permanent teeth was the highest in Central Asia (48,470 ± 1737) and the lowest in Australasia (19,515 ± 3101), while severe tooth loss was the highest in Australasia (20,346 ± 16,899) and the lowest in Southeast Asia (8517 ± 7327) [5]. Furthermore, a positive relationship was reported to exist between the prevalence of periodontal diseases with cardiovascular diseases, chronic respiratory diseases, diabetes, urogenital, blood, and endocrine diseases [5]. Therefore, maintaining a good oral health status is a sine qua non to having a better general health and quality of life. Varenne *et al. [6]* reported that about 38% of children at age 6 in Burkina Faso had dental caries and the prevalence was higher among urban children than rural ones. However, 56% cases of gingivitis and calculus occurred dominantly in all age group from age 6 years old to 44 years old. High incidence of plaque and calculus was also found among 66% of respondents in a survey done in Kwara State of Nigeria, with children aged 12 reporting higher incidence of plaque and gingivitis than the adult population while 13% incidence of dental caries was reported as the lowest oral condition in the state [7]. In a study done in Kano, a northern city in Nigeria, 49.8% of children and adults reported dental caries as the most common challenge [8], however, Osuh *et al.* reported a higher prevalence of oral diseases among residents in slums compared with non-slum urban residents in Ibadan, a city in western Nigeria [9]. Oral health disease is on the increase in Nigeria and preventive strategy must be prepared after a comprehensive study on the spread of oral diseases is done.

Thus, the aim of this paper is to investigate and report on the prevalence of dental diseases in Oke Ogun rural communities of Oyo State in Nigeria. It is the expectation of the researchers that this paper would help to identify the dental needs of rural communities and comprehensive intervention programs could be prepared by policy makers.

2. Materials and Methodology

This is a retrospective study of patients seen during a community outreach program which was undertaken by Cleft & Facial Deformity Foundation (CFDF) over a period of two weeks, first phase in May 2019 and second phase in September 2019. The outreach program was done in 10 Local Government Areas in the northern part of Oyo province of Nigeria, which are geographically designated as "Oke-Ogun". Oke-Ogun is a farming community which serves as the major provider of food for South-western Nigeria and has a population of about 1,579,940 million people [10]. Also, it has been observed that when compared with urban communities in the Oyo State, Oke-Ogun has gross disparity in socio-economic development as indicated by the poor health facilities, low economic investment, and inadequate education facilities.

Cleft and Facial Deformity Foundation (CFDF) is an indigenous non-governmental organization (NGO) with focus on oral and perioral diseases. The outreach program, which is carried out by dentists and dental auxiliaries, is rotated among different communities in Nigeria, with special interest on those communities with low socio-economic development. The program was designed to examine, diagnose dental diseases, and carry out free surgeries for patients in the visited community. Medical cases such as hypertension, diabetes, malaria was not within the scope of this program, only dental cases were seen. Permission was obtained from the State Health Ministry, the local government chairman and the supervisory councilor for Health. Mobilization was done with the involvement of local community leaders through the local television stations, radio jingles, posters, and town criers. It is the practice of CFDF to collect data such as name, sex, age, address, and occupation from the assembled villagers, using the Standard Hospital Case files.

Operative Technique

Four calibrated examiners who have been calibrated on two occasions with 10 patients carried out oral examination with gloves and face mask using sterilized dental probe and mouth mirror over an overhead light with patient seated on a locally fabricated dental chair (**Figure 1**). After the examination and diagnosis, free treatment including counseling, scaling, and Polishing, atraumatic filling and dental extractions were offered. Patients were referred to the only two dental clinics located within the 10 provinces for follow-up and management of any possible complication.

Data extracted from the case files included demographics, presenting complains, diagnosis, treatments, and referrals; these were analyzed using SPSS software (IBM SPPS Statistics, Version 23). Categorical variables were described using frequency distribution and percentage, chi-square test and Fischer's exact test were calculated when applicable. $P < 0.05$ was considered statistically significant.

Figure 1. Patients being examined in locally fabricated dental chairs.

3. Result and Discussion

Oral health diseases despite being one of the most common public health issues have often been neglected when public health policy is prepared. It has been reported that the burden of oral health diseases such as periodontal diseases, oral cancer and caries increased significantly from 1990 to 2010 in parallel with major non-communicable diseases like diabetes [11].

This study was carried out among 1,396 respondents with Okeho community recording the highest number of participants in the outreach program (**Table 1**). The most common complaint was toothaches at 43.6% with more female respondents complaining than male (**Table 2**). This agrees with the study done at Benin City in Nigeria where 71.1% patients among 613 respondents had toothaches as the main reason for seeking dental care [12]. In a similar study done at the University of Nigeria Teaching Hospital, 49.1% of patients had toothaches as the main reason for visiting the dental clinic [13]. Although, the two studies mentioned were done in urban setting as against the present study, which was done in rural communities, pain remain the most common reason for seeking dental treatment.

Furthermore, the complaint of pain seems to have a positive correlation with gingivitis which was recorded in 511 (36.6%) of the respondents in the communities while 51 (3.7%) had dental caries (**Table 3**). This disagrees with the study of Varghese *et al.* [3] which was done in an urban community in India who reported dental caries as highest at 78.75%. Oral diseases were recorded higher in males 776 (55.6%) than females 620 (44.4%) with gingivitis and chronic periodontitis reported to be more in males than females and this is statistically significant at ≤0.002 (**Table 4**). This is in support of the view that there is higher incidence of periodontal diseases in males than females although, females have a

wide-ranging of periodontal challenges which is because of hormonal changes in different phases of their life [14] [15]. Nevertheless, the high prevalence of periodontal diseases recorded in these communities, gingivitis at 511 (36.6%) and

Table 1. Different community locations visited during with patient distribution.

Location	Frequency	Percentage
Kishi	133	9.5
Ago-amodu	113	8.1
Otu	115	8.2
Okeho	177	12.7
Iwajowa	88	6.3
Ago-are	109	7.8
Igboho	119	8.5
Tede	84	6
Saki	147	10.5
Ilero	66	4.7
Iseyin	130	9.3
Ipapo	115	8.2
Total	**1396**	**100**

The highest number of patients 177 (12.7%) were recorded in Okeho, followed by Saki, 147 (10.5%) and least number 66 (4.7%) from Ilero.

Table 2. Presenting complaints with sex distribution.

Compaints	Male	Percentage	Female	Percentage	Total	Percentage
Toothache	302	21.6	307	22	609	43.6
Wants Cleaning	192	13.7	101	7.2	293	21
Dentine Hypersensitivity	35	2.5	29	2.1	64	4.6
Mobile tooth	99	7.1	46	3.3	145	10.4
Broken Tooth	31	2.2	23	1.7	54	3.9
Retained Tooth	10	0.7	13	0.9	23	1.6
Bleeding Gum	16	1.2	6	0.4	22	1.6
Teeth Replacement	18	1.3	4	0.3	22	1.6
Caries	11	0.8	28	2	39	2.8
others	62	4.5	63	4	125	9
Total	**776**	**55.6**	**620**	**44.4**	**1396**	**100**

The most common complaint was toothache, 609 (43.6%) followed by patients that wanted cleaning, 293 (21.0%) and teeth mobility, 145 (10.4%). Few respondents, 23 (1.6%) complained of retained roots, bleeding gums 22 (1.6%) and wanted replacement of teeth 22 (1.6%).

Table 3. Pattern of diagnosis recorded among respondents.

Diagnosis	Frequency	Percentage
Gingivitis	511	36.6
Pulpitis	72	5.2
Apical Periodontitis	177	12.7
Chronic Periodontitis	234	16.8
Dentine Hypersensitivity	33	2.4
Pericoronitis	38	2.7
Endentulousness	79	5.7
Retained roots	45	3.2
Retained decidous	20	1.4
Caries	51	3.7
Crowding	7	0.5
Tooth-wear lesions	27	1.9
Fractured tooth	46	3.3
Others	56	4
Total	**1369**	**100**

Majority of the respondents, 511 (36.6%) presented with gingivitis, followed by 234 (16.8%) with chronic periodontitis and apical periodontitis 177 (12.7%). More than half of the study population presented with Gingivitis and chronic periodontitis, 745 (53.4%) patients. The lowest presenting complain was teeth Crowding, 7 (0.5%); Retained deciduous, 20 (1.4%); and Tooth wear Lesion, 27 (1.9%). Also, few cases of dental caries were recorded in 51 (3.7%) patients. Uncommon cases lumped together under "others" accounted for 56 (4.0%) and this includes chronic osteomyelitis, gingival epulis, cleft lip, hypoplasia, oral ulcer, cleidocranial dysostosis, supernumerary teeth and malunited facial bone fracture.

chronic periodontitis at 234 (16.8%) (**Table 4**), agrees with Umoh and Azodo [16] who reported a high prevalence of periodontal diseases of 90.8% (gingivitis 75.4% and periodontitis 15.4%) in Benin City, Nigeria. Also, studies by Rajasekar and Mathew [17] reported 152 (76%) gingivitis and 48 (24%) periodontitis while Tobin and Ajayi [7] also in Nigeria reported plaque and calculus as the most prevalent oral conditions at 66.0% followed by gingivitis at 30.0%. These are few pointers that periodontal diseases seem to be higher in Nigeria than dental caries.

In our study, poor oral hygiene habits and poor dental utilization was not investigated, however it has been reported that socio-demographic variables such as the level of education, occupation, cost of dental treatment and marital status [18] [19], to mention a few that affects rural dwellers, also exist in Oke-Ogun rural communities (**Figure 2**) and this may have affected their oral hygiene habits and the dental utilization of individuals leading to the high cases of periodontal

Table 4. Gender Distribution of Diagnosis Recorded and level of Significance.

Diagnosis	Male	Percentage	Female	Percentage	Total
Gingivitis	301	58.9	210	41.1	511
Pulpitis	37	51.4	35	48.6	72
Apical Periodontitis	75	42.4	102	57.6	177
Chronic Periodontist	132	56.4	102	43.6	234
Dentine Hypersensitivity	21	63.6	12	36.4	33
Pericoronitis	17	44.7	21	55.3	38
Endentulousness	52	65.8	27	34.2	79
Retained Roots	22	48.9	23	51.1	45
Retained deciduous	11	55	9	45	20
Dental Caries	26	51	25	49	51

Pearson Chi-Sq	df	Asymptotic Significance (2-sided)
33.313a	13	0.002

Table 4 shows the gender distribution of diagnosis recorded among Oke-Ogun communities. More oral diseases were recorded in males 776 (55.6%) than females 620 (44.4%). Gingivitis and Chronic periodontitis are more in males than females and it is statistically significant at ≤0.002.

Figure 2. Chronic periodontitis in 62 years old male patient recorded during the outreach program.

disease in these communities. From our study, uncommon cases that accounted for 56 (4.0%) included chronic osteomyelitis, gingival epulis, cleft lip, hypoplasia, oral ulcer, cleidocranial dysostosis, supernumerary teeth and mal-united facial bone fracture. Butali *et al.* reported a prevalence of 0.5 per 1000 cases of orofacial cleft [20] which is low and agrees with this present study, nonetheless, oral ulcers such as aphthous ulcer recorded low here has been reported as one of the most common oral diseases [21].

4. Conclusions

Dental diseases were found to be present in the Oke-Ogun rural communities

and the socio-economic situation has exponentially increased the risk of these diseases to oral health including the general health of families in these communities. Periodontal disease was found to be more prevalent, and it was statistically significant. However, there are other dental diseases that should not be neglected, and they demand urgent attention, too.

Limitation of this research was shortage of manpower since only a few qualified dentists volunteered for this program. Therefore, the effective utilization of dental auxiliaries is an area that should be explored to enable rural dwellers to benefit from oral health care and oral education.

5. Recommendations

The federal government of Nigeria may like to use studies like this to prepare a comprehensive oral health program that would focus on prevention of oral health disease through oral health education and provision of dental clinics that can be assessed by members of rural communities like the Oke-Ogun. Furthermore, the World Health Organization (WHO), the United Nations Children Funds (UNICEF) and other international organization can collaborate with indigenous non-governmental organizations such as Cleft and Facial Deformity Foundation (CFDF) to provide free management of oral and perioral diseases. This would not only improve the health of members of these various rural communities but will improve their general health and would translate to more hours spent at farms to provide more food for the country.

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Authorship

All authors have contributed significantly and agreed with the manuscripts.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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