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Prevalence of Periodontal Diseases in Orlu Local Government Area of Imo State, Nigeria

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Abstract: *There has been a global pandemic of periodontal diseases with a rising prevalence worldwide. In Nigeria, reported cases of rising prevalence have occurred because of poor oral hygiene, and other related factors. This descriptive survey study was aimed at ascertaining the prevalence of periodontal diseases in Orlu Local Government Area of Imo state, Nigeria. The main instrument for data collection was a structured interview questionnaire bordering on biodata, economic status, oral hygiene, as well as dental care assessment. A sample of 500 was randomly selected from the population i.e males and females of ages between 6-55yeras (schooling and working population). Data collected was analyzed using descriptive statistics of frequency, percentage, histograms, and pie chart. Results showed that 470(94%) respondents have had one form of periodontal disease while 30(6%) never had it. Also pain and bleeding gums had 34.6% and 19.8% and as such the commonest pattern of periodontal disease in the populace. The disease was commoner amongst 16-25years age group i.e 128(27.2%) and there was also a male preponderance of 59.4% against the female of 40.6%.Six-monthly dental check-up, and health education were recommended.*

Keywords: *Prevalence, periodontal disease, gingivitis, Orlu.*

I. Introduction

Periodontal diseases are a group of diseases that affects the tissues that support and anchor the teeth. Left untreated, periodontal disease results in the destruction of the gums, alveolar bone (the part of the jaw where the teeth arise) and the outer layer of the tooth root (Mark *et al*, 2001*)*. Several distinct forms of periodontal diseases are known. These include gingivitis, acute necrotizing ulcerative gingivitis, adult periodontitis, and localized juvenile periodontitis amidst others. Although periodontal disease is thought to be widespread, serious cases of periodontitis are not common. Gingivitis is also one of the early signs of leukemia in some children (Amitage *et al*, 1999) and a very common form of Periodontal disease (Kim et al, 2006). Gum disease or periodontal disease is a progressive condition that worsens with age. Gum diseases occur when bacteria eat away the gum tissue, causing it to pull away from the tooth. This space between the tooth and the gum is called periodontal pocket, which traps even more bacteria. Gum disease develops in two stages; Gingivitis, the early stage causes red, swollen gums that bleed easily (Preus *et al* ,1995). Gingivitis can be eliminated through good oral hygiene and dental care. If not treated, gingivitis can progress to periodontitis, when bacteria attack the bone supporting the teeth. However, the three main diseases of human teeth are tooth decay also called dental carries, gum disease or periodontal disease; and problems with tooth alignment called mal-occlusions. Human teeth problems are treated or prevented by dentists i.e professionals who are specially trained to practice dentistry (Preus *et al*, 1995).

Humphrey *et al* (2008) in a study of periodontal disease among adults in USA found out that periodontal disease is a risk factor or marker for Coronary Heart Disease (CHD) and this is independent of traditional CHD risk factors such as socio-economic status. The authors further stipulated that higher global prevalence of risk factors such as periodontitis, tooth loss, gingivitis and bone loss ranging from 1.24-1,34 (95%) was indeed significant. In an Israeli population, individuals of Yemenite, North African, Asian, or Mediterranean origin have higher prevalence of periodontal disease than individuals from European descent. This could be attributed to genetic predisposition as well as socio-cultural behavior differences (e.g. Smoking, oral hygiene, access to dental treatment) between populations (Zadik *et al*, 2008) In another study in Geneva by Muller *et al* (2008*)*, it was observed that the number of loss of teeth increases with age, hence the overall prevalence of periodontal disease tends to worsen with advancing age. Muller and colleagues further stated that in several countries, many dentate subjects approaching 60 and above, have reduced dentition and that even though the WHO goal of retaining at least twenty teeth by 80 years has not been met; some countries are

however trying towards this trend. Popat *et al* (2006*)* also noted that the adoption of "westernized" diet by the Australian indigenous community has placed them as high risk population for dental caries and periodontal diseases. These indigenes were also said to show some of the highest rates in the world for rheumatic fever which is a complication arising from periodontal disease.

In Nigeria, findings by Ehizele *et al* (2012*)* on misconceptions about oral health among a group of Nigerian primary school teachers in Benin, it was stated that out of 640 primary school teachers more than a third of respondents felt that tooth decay is caused by worms and another 0.3% felt it was caused by black magic. Another 23.2% did not consider tooth loss as a serious health problem while tooth brushing was considered ineffective in the prevention of gum disease. This survey thus revealed that misconceptions still exist amongst school teachers, this may contribute to the increasing prevalence of periodontal disease in the population. Also in another study by Onigbinde et al(2014*)*, it was found that prevalence of periodontal disease ranges from 30-100%. The study further reiterated that this was as a result of increase in estrogen metabolism and synthesis of prostaglandin that occurs during pregnancy thus further worsening dental caries, gingivitis, and periodontitis. It was therefore suggested that such women should have routine dental check-up and early management of periodontal diseases.

Various morbidities have also been associated with periodontal disease. Richard (2008*)* observed that children with periodontal disease may likely come down with Protein Calorie Malnutrition which can even lead to death of the child as a result of poor feeding. Tomas *et al* (2012) also noted that bacteremia from gingival disease could lead to very fatal morbidity and even mortality while Ebehard (2008), Nguyen (2008), Humphrey (2008), and Popat et al (2008*)* all opined that tissue death (necrosis), halitosis, Coronary Heart Disease, and Rheumatic fever where other forms of morbidities arising from periodontal disease. Jacqueline *et al* (2002*)* also stated that periodontal disease can also lead to destruction of alveolar bone and eventual tooth loss.

The periodontal disease can be prevented by simple dental hygiene with greater reduction in the incidence, morbidity rates as well as prevalence (WHO, 2006). This will in effect foster healthy dental conditions and "infectious smile and laughter without morbidity". It is against this background that this research was carried out, to ascertain the prevalence of periodontal diseases in Orlu Local Government Area of Imo State, Nigeria and suggest recommendations to effectively reduce the prevalence.

II. Methodology

The study participants were 500 male and female respondents recruited from primary, secondary, and the general populations in Orlu local government area of Imo State. Sample size was calculated using the formula;

$$n = \frac{Z^2\,p.q}{d^2}$$

Where n= minimum sample size
Z= 1.96 (constant at 95% confidence)
P= 0.5 (at 50% population prevalence from previous study)
q= 1-0.05 (1-p)
d= degree of accuracy (usually set at 0.05)
Substituting for the above; $\frac{(1.96)^2 \times 0.5 \times 0.5}{(0.05)^2} = 384.16$

Using attrition rate of 10% from previous studies thus;

$$\frac{10 \times 384.16}{100} = 38.4$$

$$384.16 + 38.4 = 422$$

422 was then increased to 500 to increase the power of the study.

The main instrument for data collection was a structured interview administered questionnaire. To each of the questionnaire, was attached a consent letter to enable each participant the choice to participate or opt out willingly. The questionnaire consisted of sections that bordered on biodata of respondents, level of economic status assessment, and questions on periodontal disease pattern of respondents. Respondents are expected to tick a "Yes" or "NO" against the point emphasized. Data was keyed into Statistical Packages for Social Sciences version seventeen using Microsoft windows seven system. The data collected was analyzed using descriptive statistics of frequency, percentage and pie chart.

III. Results

Table A: Age Group Of Respondents With Periodontal Diseases

		Periodontal Disease		
		Yes	No	Total
Age	6-15yrs	40	5	45
		8.5%	16.7%	9.0%
	16-25yrs	128	15	143
		27.2%	50.0%	28.6%
	26-35yrs	65	0	65
		13.8%	.0%	13.0%
	36-45yrs	123	9	132
		26.2%	30.0%	26.4%
	46-55yrs	114	1	115
		24.3%	3.3%	23.0%
Total		470	30	500

Table A shows that in a total of 45 respondents age 6-15 yrs, 40(8.5%) had the disease, while 5(16.7%) never had it. Then 16-25yrs, 128(27.2%) had disease and 15(50.0%) never had it. 26-35yrs, 65 (13.8%) had the disease 36-45yrs 123(26.2%) has disease while 9(30.0%) never had it. 46-55yrs, 114(24.3%) had the disease while 1(3.3%) never had it in this age group. Thus a total of 470 respondents had periodontal disease while 30 did not have.

Table B: Sex distribution of respondents

		Periodontal Disease		
		Yes	No	Total
Sex	Male	279	9	288
		(96.87%)	(3.13%)	(100%)
	Female	191	21	212
		(90.09%)	(9.91%)	(100%)
Total		470	30	500

Table B: shows sex distribution of periodontal diseases in the population. Out of the total of 288 males, 279(96.87%) had periodontal disease while only 9(3.13%) never had it. 212 females also responded and 191(90.09%) had the disease while 21(9.91%) never had it.

Table C; Socio-Economic Status Of The Respondents.

Characteristics	Number Examined	Number Infected	% Infected
Income Level (#)/ Month.			
10,000-20,000	177	159	33.8
21,000-30,000	127	119	25.3
31,000-40,000	131	127	27.0
41,000-50,000	19	19	4.0
51,000 & Above	46	46	9.8
Total	*500*	*470*	-
Rooms Occupied			
One Room	294	280	59.6
Two Room	122	110	23.4
Three-Bedroom	65	61	13.0
Bungalow	10	10	2.1
Duplex	9	9	1.9
Total	*500*	*470*	-

Table D: Periodontal disease pattern of respondents.

Pattern Of Peri-Odontal Disease	Frequency	Percentage %
None	30	6
Pain In The Gums (Gingivitis)	173	34.6
Bleeding Of The Gums	99	19.8
Tooth-Ache	88	17.6
Mal-Occlusion	29	5.8
Dental Caries / Hole In Tooth	41	8.2
Trauma To The Gums	22	4.4
Trench Mouth	18	3.6
Total	*500*	*100*

In Table D, it is shown that 30(6%) of the total study population never had any form of periodontal disease while about 173(34.6%) of respondents had pain in the gums (gingivitis) and as such was the commonest form of periodontal disease, followed by bleeding gums 99(19.8%), and toothache 88(17.6%).

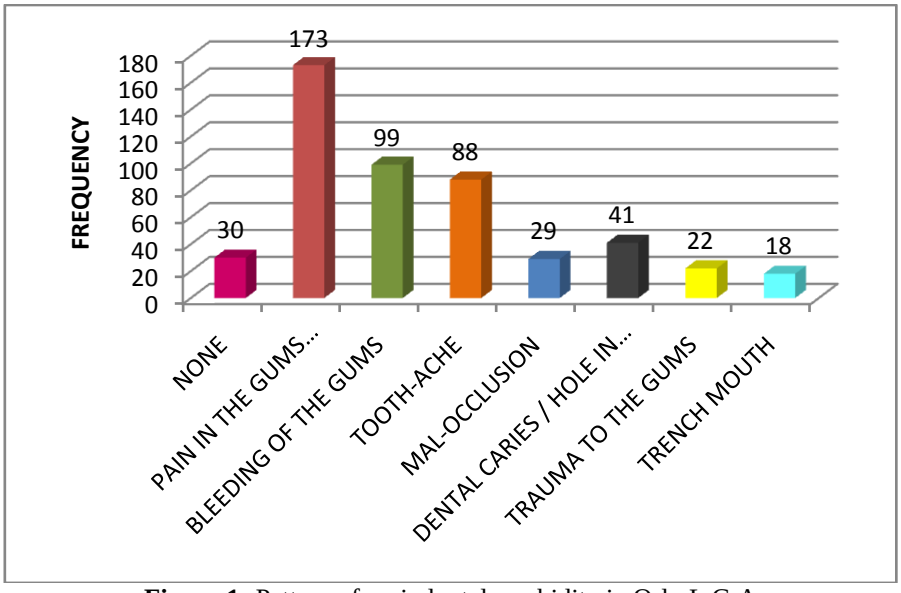

Figure 1; Pattern of periodontal morbidity in Orlu L.G.A

Pain and bleeding gums caused the highest morbidity, never the less all contributed to the high prevalence of the disease burden. The pattern of periodontal morbidity in the study population is shown in Fig. 1.

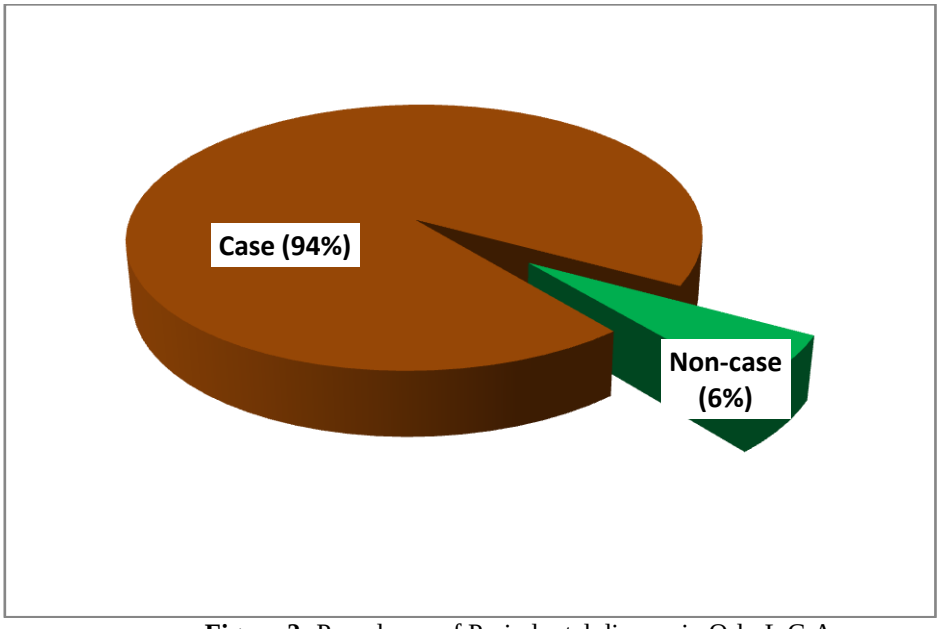

Figure 2; Prevalence of Periodontal disease in Orlu L.G.A

There is a high prevalence of periodontal disease considering 94% of the respondents to those (6%) not having the disease. This is shown in Fig. 2. It thus implicates a high morbidity burden
470/500 x 100/1 = 94% cases
30/500 x 100/1 = 6% (non – cases)

IV. Discussion

Epidemiologic studies have shown that periodontal diseases in children and adolescents were nearly universal(Joseph *et al*, 2003). Maduakor *et al* (2000) also opined that there has been an established prevalence of periodontal diseases in Nigeria and this varies from region to region. In Orlu local government area, 470 respondents out of 500 had one form of periodontal disease or the other, that is 94% of cases and 6% non cases, this is thus indicative of a high prevalence and morbidity burden.

Concerning pattern of periodontal disease, pain in the gums (gingivitis) was the commonest in the respondents(34.6%). This goes to support the view by Kim et al (2006) and Amar (2003) that gum disease is the most prevalent form of periodontal disease. Mark *et al* (2001) also believed that gingivitis results from poor oral hygiene hence proper brushing of teeth and flossing decreases plaque build-up and ensures peri-oral health. This fact was consolidated in the study where those who brush two or more times had less disease burden, therefore, Sheiham and Watt (2000) agreed that knowing when to brush and cleaning the teeth regularly thus ensures good oral hygiene and periodontal health. This study also shows that there is a high prevalence of periodontal diseases in the local government area and is commoner in the age group 16-25 years(27.2%). The prevalence of periodontal disease increases with age (Maduakor et al, 2000; Ragghianti et al, 2004; Eke et al, 2012).Among the respondents in this study, the prevalence of periodontal disease was more in males than females(96.87 % Vs 90.09 %). This agrees with earlier works that men, indeed, have a greater prevalence of periodontal disease than women globally (Shiau and Reynolds, 2010; Furuta et al, 2013; Haytac et al, 2013). Male preponderance in the prevalence of periodontal disease has also been reported in other climes, including USA(Albandar, 2002), Japanese (Furuta et al, 2010), Filipino (Horning et al, 1992), Brazilian (Susin et al, 2005) and Tanzanian surveys (Mumghamba et al, 1995). Some of the possible reasons being adduced for the increased prevalence in males include poorer oral hygiene and dental –visit behaviour, as well as alcohol intake (Abdellatif and Burt, 1987; Ragghianti et al, 2004; Shiau and Reynolds, 2010) and sex hormones (Shiau and Reynolds, 2010).
This study also demonstrated that the prevalence of periodontal disease among the respondents was more in the middle and lower socio-economic group. This supports the work of Cullinan *et al* (2009) that level of financial and educational attainment at times correlates with one`s level of personal care, including oral hygiene. In conclusion, this study has shown that the prevalence of periodontal disease is very high in Orlu local government area of Imo State (96%) and the increased prevalence is more in males, 16-25 age group, middle and lower socio-economic group. We therefore recommend that possible reduction in incidence of this disease could be achieved by routine six-monthly dental check-up in primary, secondary school age groups as well as the general populace, health education on oral hygiene and early detection and treatment of cases of peri oral diseases.

Ethical approval

Approval was obtained from Imo state University Teaching hospital ethical committee, located in Orlu local government area.

Conflict of interest

None was declared.

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