Periodontal treatment needs of urban and rural populations in Edo State, Nigeria.

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Abstract

Objective: To determine the Periodontal Treatment Needs of urban and rural population in Edo State, Nigeria, and ascertain if there is any difference, using the Community Periodontal Index of Treatment Needs (CPITN).
Method: All patients who reported at the venue selected rural and urban centres during a sixteen month period participated in the study. A questionnaire was used to obtain socio-demographic information of each subject after which oral examination was carried out.
Result: A total of 2161 subjects (769 urban and 1392 rural), aged 10 years and above participated in this study. There was a significant difference in the prevalence of periodontal disease between urban and rural areas ($P < 0.05$), which spanned across all age groups and sexes. There was no significant difference in the mean number of sextant by age and sex. Only 0.9% of rural subjects had no periodontal disease, compared to 7.7% urban subjects. More of the rural subjects (94.4%) needed scaling and polishing plus oral hygiene instructions (TN2) when compared to urban subjects (74.8%).
Conclusion: The study showed that, there was no significant difference ($P > 0.05$) in the Periodontal Treatment Needs (TN) between urban and the rural areas. The type of treatment most required by both urban and rural populations was scaling and polishing and oral hygiene instructions.

Keywords: Periodontal, treatment needs, Urban and Rural

Introduction

Several studies have shown that irrespective of the age of the dentate population, periodontal disease is highly prevalent in Nigeria[1-4]. In a study of the periodontal status, awareness and treatment needs of Nigerian subjects using CPITN, it was found that only 0.6% of the subjects did not require periodontal treatment[5]. Few studies have been undertaken to ascertain if there are differences in the prevalence of periodontal disease and its treatment needs between Northern and Southern Nigeria, between states and between Local Government Areas. A study attempted to elucidate differences in the periodontal status between urban and rural Nigerians which involved a survey of 14 out of 19 states in the Federal Republic of Nigeria[6]. The result showed that the need for periodontal therapy was high, though differences between urban and rural areas were not significant. This study did not mention which states were covered and it is not certain if Bendel State (from which Edo State was created) was one of these.
Anecdotal reports emanating from the various dental facilities within this region indicate that prevalence of periodontal disease is higher amongst the rural populace. The authors are not aware of any scientifically organised study carried out to date to verify these reports.
This study was carried out, to determine the prevalence of periodontal disease and Periodontal Treatment Needs (PTN) in urban and rural populations in Edo State. This will provide a baseline data for the planning, execution and monitoring of oral health programmes in the state

Materials and Method

Edo State is located in mid-southern Nigeria. It has a population of approximately 2.2 million[7] Benin City, which is the urban centre chosen for this study is the capital of the State. The rural centres used in this study are located within 20 kilometres of Benin City.
Examinations were carried out over a 16month period. All patients who reported at the various rural health centres consisting of Nigerian Institute for Oil Palm Research (NIFOR) Health Centre, Primary Health Care Centres at Utekon and Ugbogiobo during the study period were examined. At the University of Benin Teaching Hospital (Urban Centre), all the patients attending the Dental Centre for the first time during this period were also examined.

Examiners were calibrated before the survey and the inter-examiner reliability was found to be good. At each centre where patients were seen, a questionnaire, designed to obtain socio-demographic information was first administered to each subject. The questionnaires, was filled by each subject and where the subject was not sufficiently literate or had difficulty with the questionnaire, assistance was provided by the authors. After the completion of the questionnaire, all the subjects were examined. The examination of the mouth was carried out with the patient sitting on an armchair facing an open window with natural daylight used as the light source. Examinations were conducted with the use of a tongue depressor and the Community Periodontal Index of Treatment Need (CPITN) Probe(WHO TRS 621).The CPITN[8-10] examination was carried out using the methods as outlined in the WHO guide on oral health surveys[11].

Data Management and Analysis

All the data collected, were edited and summarized, by the authors. Initial tabulation and analysis were carried out manually. Further statistical analysis was carried out using the Epi Info 2000 version 1.1.2 The dependent variable in this study was the location of subjects (urban vs rural). As almost all the variables in this study were categorical variables, chi-square analysis was used, as the test statistic for detecting associations between the dependent variable and all the other variables. In addition, to ensure effective comparisons between the urban and rural populations, simple percentages of the total subjects in each group were first obtained (as a measure of proportions) and then these were reduced to integers, before further analysis was undertaken. Where expected frequencies were 5 or less, as much as possible adjacent groups were merged. The alpha level was set at 0.05. Missing responses were not included in any of the analyses. The computation of mean sextants by CPITN, were as outlined by Cutress et al. [10]

Results

A total of 2,161 subjects were examined, comprising of 769 subjects from one urban area and 1392 subjects from three rural areas.

Table 1 shows that there was significant difference in the prevalence of periodontal disease ($p < 0.05$) between urban and rural subjects. Majority in both groups (59.3% urban and 79.0% rural) had subgingival calculus, while the proportion of urban subjects with only slight bleeding on probing (17.7%), was greater when compared with the rural subjects (4.7%). However, Table 2 shows that more urban (7.7%) than rural subjects (0.9%) required no periodontal treatment, while more of the rural subjects (94.4%) needed scaling and polishing plus oral hygiene instruction, when compared to urban subjects (74.8%). This difference was not statistically significant ($p>0.05$).

The differences in the prevalence of periodontal disease between urban and rural subjects were all statistically significant for all age groups. Urban subjects with healthy gingiva (CPITN = 0) were within the age range of 10 29 years, while the rural subjects were within 20-49 years. In both groups, those within the age range of 20 29 years formed the core of those without periodontal disease (Table 3). This table also showed that the rural subjects had more calculus when compared to the urban subjects. From the age of 40 years, the presence of healthy gingiva was virtually absent in both groups while presence of shallow pockets became obvious with increasing age.

Table 1. Prevalence of periodontal disease of the study population

CPITN(Max) Score	Location of subjects: Urban(%)	Rural(%)	Total(%)
0	59(7.7)	13(0.9)	72(3.3)
1	136(17.7)	65(4.7)	201(9.3)
2	456(59.3)	1100(79.0)	1556(72.0)
3	101(13.1)	203(14.6)	304(14.1)
4	17(2.2)	11(0.8)	28(1.3)
Total	**769(100.0)**	**1392(100.0)**	**2161(100.0)**

$X^2 = 16.06$; $p = 0.028^*$

The assessment of the Periodontal Treatment Needs for different age groups, revealed statistically, significant differences between urban and rural subjects only for the age groups 10-19 years, 40-49 years and 50-59 years (Table 4). For all the other age groups, the differences were not statistically significant. In the 10-19 years age group, 10.7% of the urban subjects needed no treatment when compared to none amongst the rural subjects. In this group, 96.5% of rural subjects needed scaling and polishing in addition to oral hygiene instruction, compared to only 60.1% of urban subjects. In the 40-49 years age group, the entire population of urban subjects needed scaling and polishing plus oral hygiene instruction as compared to 97.3% of rural subjects.

The need for complex periodontal treatment starts becoming prominent from the 50-59 years age group, in both urban and rural subjects.

Table 2. Periodontal treatment needs of urban and rural subjects

Area	No(Subjects)	Periodontal Treatment Needs (%): 0	1	2	3
Urban	769	7.7	92.3	74.8	2.2
Rural	1392	0.9	99.1	94.4	0.8

$X^2 = 7.32$; $p = 0.058$

There were statistically significant differences in the prevalence of periodontal disease when the sexes of both areas were compared (Table 5). However, the association between sex and Periodontal Treatment Needs in Table 6 indicated that a greater proportion of male subjects, both in the urban and rural areas, required some form of periodontal treatment when compared to female subjects. Urban and rural sex differences for Periodontal Treatment Needs were not statistically significant.

Using the WHO cumulative tabulation that indicates the mean number of sextants (per dentate subject), Tables 7 and 8 show that the mean numbers of sextants were not

Table 3: Relationship between age and prevalence of periodontal disease

Age Group (Years)	Area	No	CPITN (Max) Percentage Score 0	1	2	3	4	Stat. Signif.
10-19	U	168	10.7	29.2	60.1	-	-	P=0.00*
	R	284	-	3.5	96.5	-	-	
20-29	U	347	11.8	19.6	50.4	16.7	1.5	P= 0.00*
	R	262	3.8	12.2	80.2	3.8	-	
30-39	U	116	-	16.4	83.6	-	-	P= 0.00*
	R	178	1.1	5.6	81.5	11.8	-	
40-49	U	31	-	-	48.4	51.6	-	P= 0.00*
	R	336	0.3	2.4	70.8	25.3	1.2	
50-59	U	52	-	-	61.5	28.9	9.6	P= 0.01*
	R	271	-	1.8	70.2	27.3	0.7	
Above 60	U	55	-	-	65.5	21.8	12.7	P= 0.4
	R	61	-	-	70.5	21.3	8.2	

U=urban, R=rural, *=Statistically Significant

statistically significantly different between urban and rural subjects for all age groups and when sexes of both areas were compared.

Discussion

This study has shown that in Edo State, only 3.3% of the entire group studied had healthy periodontal condition (Code = 0). This is greatly in favour of the urban areas. However, other studies for the entire country have reported lower figures but did not indicate if there are differences between urban and rural areas[5, 12]. This could be attributed to the fact that Edo State is one of the educationally advanced states in Nigeria. The rural areas have a lower proportion of those with healthy periodontium (Code=0) and a high proportion of those with calculus and pockets (Code= 2 and 3) as compared to those from urban. This could be attributed to the gross lack of information, low level of education, low income, and the non-availability of dental services. All these factors are known to contribute to low level of oral hygiene awareness. The less effective traditional methods of cleaning used predominantly in rural areas may also be a contributing factor.

This finding further buttresses the earlier reports, that the prevalence of periodontal disease is high in Nigeria [3-6, 12-14]. The most predominant conditions are those associated with calculus (Code = 2). These investigators did not however state if differences exist between urban and rural areas. The difference in periodontal prevalence which existed in this study between urban and rural populations is similar to the report of a study carried out in Swaziland [15].

Some workers have shown age to be a factor in the prevalence of periodontal disease. The proportion of subjects with a healthy periodontium decreases with age while the reverse is the case with the presence of calculus and pocketing irrespective of the location[16-18]. This is similar to findings in this study. This study has also shown that there are significant differences in the prevalence of periodontal disease at all age groups between the urban and rural areas. This also applies to male and female subjects.

Table 4 Age and periodontal treatment needs of subjects

Age Group (Years)	Area	No	Treatment Needs 0	1	2	3	Stat. Signif.
10-19	U	168	10.7	89.3	60.1	-	P= 0.00*
	R	284	-	100	96.5	-	
20-29	U	347	11.8	88.2	68.6	1.5	P= 0.06
	R	262	3.8	96.2	84.0	3.8	
30-39	U	116	-	100	83.6	-	P= 0.53
	R	178	1.1	98.9	93.3	-	
40-49	U	31	-	-	100	-	P= 0.00*
	R	336	0.3	99.7	97.3	1.2	
50-59	U	52	-	-	100	9.6	P= 0.00*
	R	271	-	100	98.2	0.7	
60and Above	U	55	-	-	100	12.7	
	R	61	-	-	100	8.2	

U=urban, R=rural, *=Statistically Significant

Table 5 Relationship between sex and prevalence of periodontal disease

Sex	Area	No	CPITN (Max Percentage Score) 0	1	2	3	4	Stat. Signif.
Male	U	287	2.8	14.6	55.4	22.6	4.5	P = 0.00*
	R	1012	-	3.0	76.9	19.1	1.0	
Female	U	482	10.6	19.4	61.7	7.5	0.8	P = 0.00*
	R	380	3.4	9.2	84.7	2.6	-	

U=urban, R=rural, *=Statistically Significant

Table 6 Sex and periodontal treatment needs of subjects

Sex	Area	No	Periodontal Treatment Needs (%) 0	1	2	3	Stat. Signif.
Male	U	287	2.8	97.2	82.6	4.5	P = 0.08
	R	1012	-	100	97.0	1.1	
Female	U	482	10.6	89.4	70.0	0.8	P = 0.07
	R	380	3.4	96.6	87.4	-	

U=urban, R=rural,

There is no statistically significant difference in the Periodontal Treatment Needs between urban and rural areas. However, as much as 94.4% of rural subjects and 74.8% of urban subjects needed scaling and polishing plus oral hygiene instruction. This finding persisted across all the age groups with minor variations and bears some similarity with previous work done [6,17-19]. These are conditions that can be managed by dental auxiliary personnel who can be included in the team manning primary health care centres already in existence in this country[19,20]. The need for complex periodontal treatment

Table 7 Age group and distribution of mean number of sextants by CPITN

Age Group (Years)	Area	No	Mean number of sextants 0	1	2	3	4	Stat. Signif.
10-19	U	168	0.9	2.9	2.2	-	-	P = 0.39
	R	284	0.4	1.6	4.0	-	-	
20-29	U	347	2.1	1.0	2.2	0.6	0.1	P = 0.76
	R	262	0.8	1.8	3.3	1.1	-	
30-39	U	116	0.8	2.2	2.9	0.1	-	P = 0.49
	R	178	0.2	1.3	4.2	0.3	-	
40-49	U	31	0.9	1.4	3.2	0.5	-	P = 0.69
	R	336	0.1	0.5	4.8	0.6	0.1	
50-59	U	52	0.3	2.3	2.5	0.6	0.4	P = 0.68
	R	271	0.1	0.9	4.5	0.4	0.1	
60 and	U	55	0.2	1.1	2.6	1.5	0.6	P = 0.34
Above	R	61	0.3	0.5	2.5	1.5	1.2	

U=urban, R=rural

Table 8. Sex and distribution of mean number of sextants by CPITN

Sex	Area	No	Mean number of sextants 0	1	2	3	4	Stat. Signif.
Male	U	237	0.7	1.2	3.0	0.9	0.2	P = 0.47
	R	1012	0.1	1.0	4.5	0.3	0.1	
Female	U	482	1.8	1.9	2.1	0.1	0.1	P = 0.62
	R	380	0.7	1.5	3.7	0.1	-	

U=urban, R=rural

showed prominence only from the 50-59 years age group in both urban and rural populations. This is not different from what was previously reported[19,21,22].This study showed that a greater proportion of male subjects needed more periodontal treatment than the females. This finding is similar to some previous reports [23, 24] but disagrees with other findings [6,20, 25 - 27]. Urban and rural sex differences for periodontal treatment needs were not statistically significant.

Conclusion

The study showed that, despite the high prevalence of periodontal disease in the population, there was statistically significant difference in the prevalence of periodontal diseases, which was more predominant in the rural areas. However, there was no significant difference ($p > 0.05$) in the Periodontal Treatment Needs (PTN) between urban and rural populations. The type of treatment most required by both urban and rural populations was scaling and polishing and oral hygiene instructions.

References

1. Enwonwu CO, Edozien JC. Epidemiology of periodontal disease in Western Nigeria in relation to socio-economic status. Arch Oral Biol 1970;15:1231-1244.
2. Henshaw NE, Adenubi JO. Periodontal disease in Northern Zone of Nigeria. Nig Med J 1975; 5: 152-159.
3. Macgregor IDM, Sheiham A. Pattern of periodontal pocketing in Western Nigeria Populations. J Periodontol 1974; 45:402-409.
4. Ana JR, Kumar V. Prevalence and severity of periodontal disease in adult Nigerians. Nig Dent J 1980; 1: 7-15.
5. Savage KO. Periodontal status, awareness and treatment of Nigerian subjects. Dissertation. National Postgraduate Medical College of Nigeria. Faculty of Dental Surgery. 1990.
6. Okoisor FE, Kumar V. Demand and need for dental care in Nigeria. Trop Dent J 1982; 1:17-18.
7. Federal Republic Nigeria, Official Gazette. 1991 Population Census. 15th April 1997; 84: 277-293.
8. World Health Organisation. Epidemiology, aetiology and prevention of periodontal disease. Report of a WHO Scientific Group. WHO. Techincal Report Series 1978; No.621.Geneva.
9. Ainamo J, Barmes D, Beagrie G, Cutress T, Martin J, Sardo-Infirri J. Development of the World Health Organisation (WHO) Community Periodontal Index of Treatment Needs (CPITN). Int Dent J 1982; 32: 281-291.
10. Cutress TW, Ainamo J, Sardo-Infirri J. The Community Periodontal Index of Treat Needs CPITN, procedure for population groups and individuals. Int Dent J 1987; 37: 222-231.
11. World Health Organisation. Oral Health Surveys, Basic Method. 3rd ed. W.H.O.1987; Geneva. p. 31-32.
12. Adegbembo AO, el-Nadeef MA. National survey of periodontal status and treatment need among Nigerians. Int Dent J 1995; 43: 197-203.
13. Sheiham A. The prevalence and severity of periodontal disease in rural Nigerians. Dent Practit 1966A; 17:51-55.
14. Sheiham A. Epidemiology of chronic periodontal disease in Western Nigeria School Children. J Periodont Res 1968; 3: 257-267.
15. Gugushe TS, Rossouw LM, ed Vries J. Project Swaziland (Part 3): Periodontal health status of 12 year old school children. J Dent Assoc S Afri 1993; 48: 510-512.
16. Alcala M, Gomez E, Garcia A, Fernandez-Crehuet J. The periodontal treatment of Malagan adults. Eur J Epidemiol 1993; 9: 229-232.
17. Cohen HD, Fisher R, Mann J, Berg RG. Periodont treatment needs and oral hygiene among Ethiopian immigrants. Int Dent J 1995; 45: 204-208.
18. Nordblad A, Kallio P, Ainamo J, Dusadeepa A. Periodontal treatment needs in populations under 20 years in Espoo, Finland and Chiangmai Thailand. Comm Dent Oral Epidemiol 1986; 14: 129-131.
19. Garcia ML, Cutress TWS. A national survey of periodontal treatment needs of adults in the Philipines Comm Dent Oral Epidemiol 1986; 14:313-316.

20. Louw AJ. Periodontal profile of the urban population of South Africa. J Dent Res 1993;72: 766 (abstr.).
21. Garcia-Godoy F, Cordero DA, Sanchez CM, Batista J. Periodontal treatment needs in 12-16yrs old children from Santo-Domingo. Comm Dent Oral Epidemiol 1986; 14: 150-152.
22. Crossner CG, Unell L. A longitudinal study of dental health and treatment need in Swedish teenagers. Comm Dent Oral Epidemiol 1986; 11: 342-346.
23. Kallio P, Ainamo J. Periodontal disease, dental caries and tooth loss in two Nigerian populations. Afric Dent J 1988; 2: 61-64.
24. El-Angbawi MF, Younes SA. Periodontal disease prevalence and dental needs among school children in Saudi-Arabia. Comm Dent Oral Epidemiol 1982; 10: 98-99.
25. Beck JD, Lainson PA, Field HM, Hawkins BF. Risk factors for various levels of periodontal disease and treatment need in Iowa. Comm Dent Oral Epdemiol 1984; 12: 17-22.
26. Frencken J E R M, Truin GJ, Kong KG, Ruiken RM H N, Elvers HJW. Prevalence of caries, plaque and gingivitis in an urban and rural Tanzanian child population. Comm Dent Oral Epidemiol 1986; 14: 161-164.
27. Bouma J, Van De Poel F, Schaub RMH, Uitenbroek D. Differences in total tooth extraction between an urban and rural area in The Netherlands. Comm Dent Oral Epidemiol 1986; 14: 181-183.