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Periodontal Disease Status In Aurangabad District Of Maharashtra, India: A Prevalence Study

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Abstract

Introduction: *Gingival and periodontal diseases in their various forms have affected human health since the dawn of history. Periodontal diseases are the major dental problems, which affect people worldwide. The extent and the severity of periodontal disease vary according to various demographic factors. The steady rise in periodontal disease can be stalled by investigating the peridontium at the early stage of periodontitis, resulting in better oral health-related quality of life. With this background a study was planned by Rural Health And Training Center, Paithan to determine the prevalence of periodontal disease among the community in Aurangabad district.*

Materials and Methods

It was a community focused, prevalence study carried out in field practice area of Rural Health And Training Center, Paithan. Aurangabad District was chosen for the study because it is a capital place of Marathwada region. Sample selection was done using Pathfinder methodology from Urban I, Urban III and Rural areas. Five index age groups were included: 5-6 yrs, 12 yrs, 15-18 yrs, 35-44 yrs and above 65yrs and total sample size of 2400 was selected.

The standard proforma was designed for Community Periodontal Index and Treatment Needs (CPITN) according to WHO Oral Health Assessment Form.

All the findings were recorded in the data sheet after thorough examination.

Statistical analysis: *The data of respondents was collected and compiled. Prevalences were calculated. The proportions were compared using Chisquare test and the level of significance was set at P<0.05.*

Results: *In the present study out of the total subjects, 14.87% of people were with healthy periodontal tissue whereas 85.13% of people were affected with periodontal disease.*

Conclusion: *Thus periodontal disease is a major dental disease affecting almost two third of the population. To reduce the disease burdon early diagnosis and treatment should be implimented.*

Keywords: *Oral Health, Periodontal disease, prevalence, Community Periodontal Index*

Introduction

Oral health being an integral component of general health has an impact on health and quality of life. Of all diseases prevalent in the world, oral diseases are perhaps the most wide-spread. No population is free from caries and periodontal disease and yet there are perhaps no other diseases which are so preventable through regular oral hygiene, optimal use of fluorides and proper nutrition.

Gingival and periodontal diseases in their various forms have affected human health since the dawn of history. Periodontal diseases are the major dental problems, which affect people worldwide.[1] The extent and the severity of periodontal disease vary according to various demographic variables and other factors.

Periodontal disease is an inflammatory chronic condition that damages the tissues that surrounds teeth and can also be considered a global public health problem, as it is rising in every region among all socioeconomic classes.[2] Additionally, unlike dental caries, periodontal epidemiological methods have been inconsistent.[3]

Many studies and research found that not all cases of gingivitis developed into periodontitis. The progression of the disease is dependent on the exposure of individuals to various local, environmental and genetic risk factors. Risk factor assessment is very important for prevention and control of the periodontal disease. Various risk factors such as age, education, occupation and deleterious habits like smoking and areca nut chewing have been reported to have a significant influence on the periodontal status of the population.[4] General unawareness, infrequent dental visits, lower socioeconomic status, and illiteracy have contributed to its high prevalence.[5]

The steady rise in periodontal disease can be stalled by investigating the peridontium of an individual at the early stage of periodontitis, resulting in better oral health-related quality of life. With this background a study was planned by Rural Health And Training Center, Paithan under Govt. Medical College, Aurangabad of Marathwada region of Maharashtra, India with the objectives to determine the prevalence of periodontal disease among the community.

Materials and Methods

Study design: It was a community focused, prevalence study.

Study area: Field practice area of Rural Health And Training Center, Paithan of Govt. Medical College, Aurangabad, Maharashtra, India.

Study period: 1st June 1993 to 31st March 1994.

Study population: Aurangabad District was chosen for the study because it is a capital place of Marathwada region. Sample selection was done using Pathfinder methodology. For urban population, 4 sites from Aurangabad city; for Urban III/Semi-urban population, 2 sites from Paithan and 2 sites from Kannad and for rural population 4 villages from Aurangabad district i.e. Phulambri, Kachner, Adul and Hathnoor were selected.

Five index age groups were included: 5-6 years, 12 years, 15-18 years, 35-44 years and above 65years. As per the standards of pathfinder methodology, there should be the minimum 20 subjects in each cluster. Male: Female ratio was tried to be kept as 1:1. Applying this sampling distribution to the entire population the total sample size of 2400 was selected.

Study tool: The standard proforma was designed for Community Periodontal Index and Treatment Needs (CPITN) according to WHO Oral Health Assessment Form. A pilot study was carried out on 40 subjects and continued on entire subjects for data collection.

Three indicators of periodontal status were used for the assessment:

1) Presence or absence of gingival bleeding.

2) Supra-or subgingival calculus.

3) Periodontal pockets-subdivided into shallow (4-5 mm) and deep (6 mm or more).

Index teeth: For adults aged 20 years and above, the teeth to be examined are: 17, 16, 11, 26, 27, 36, 37, 31, 46 and 47.

For young people upto age of 19 years, only six teeth-16, 11, 26, 36, 31 and 46 were examined.

Codes were given as follows:

0 – Healthy.

1 – Bleeding observed, directly or by using mouth mirror, after sensing.

2 – Calculus felt during probing.

3 – Pocket 4 or 5 mm.

4 – Pocket > 6 mm.

Following instruments were used for the examination:

1. Mouth Mirror.

2. Caries Explorers.

3. Periodontal Probe.

4. Concentrated sterilized solution.

All the findings were recorded in the data sheet after thorough examination.

Statistical analysis: The data of respondents was collected and compiled. Prevalences were calculated. The proportions were compared using Chisquare test with and without Yate's correction and the level of significance was set at $P<0.05$.

Results:

Table 1: SOCIO-DEMOGRAPHIC PROFILE of study population

Sr. No.	Socio-demographic profile	Urban	Urban III	Rural	Total
1	**Sex**				
	Male	400(33.33)	400(33.33)	400(33.33)	1200(100)
	Female	400(33.33)	400(33.33)	400(33.33)	1200(100)
	Total	800(33.33)	800(33.33)	800(33.33)	2400(100)
2	**Age**				
	5-6	160(33.33)	160(33.33)	160(33.33)	480(100)
	12	160(33.33)	160(33.33)	160(33.33)	480(100)
	15-18	160(33.33)	160(33.33)	160(33.33)	480(100)
	35-44	160(33.33)	160(33.33)	160(33.33)	480(100)
	65+	160(33.33)	160(33.33)	160(33.33)	480(100)
	Total	800(33.33)	800(33.33)	800(33.33)	2400(100)
3	**Religion**				

	Hindu	564(30.90)	598(32.767)	663(36.328)	1825(100)
	Muslim	130(34.574)	131(34.840)	115(30.585)	376(100)
	Buddhist	106(53.266)	71(35.678)	22(11.055)	199(100)
	Total	800 (33.33)	800(33.33)	800(33.33)	2400(100)
4	**literacy status**				
	Illiterate	91(27.002)	106(31.454)	140(41.543)	337(100)
	literate	118(57.560)	57(27.804**)**	30(14.634)	205(100)
	primary school	261(39.545)	19(33.181)	180(27.272)	660(100)
	middle school	142(22.756)	207(33.173)	275(44.070)	624(100)
	high school	63(31.188)	56(27.722)	83(41.089)	202(100)
	intermediate or post high school certificate	82(29.602)	122(44.043)	73(26.353)	277(100)
	Graduate and Above	43(45.263)	33(34.737)	19(20)	95(100)
	Total	800(33.33)	800(33.33)	800(33.33)	2400(100)
5	**Occupation**				
	student	472(40.55)	366(31.443)	326(28.007)	1164(100)
	dependent	66(21.927)	128(42.525)	107(35.548)	301(100)
	Housewife	53(15.186)	137(39.255)	159(45.559)	349(100)
	agricultural labour	90(50)	51(28.333)	39(21.667)	180(100)
	own business	74(37.186)	65(32.663)	60(30.151)	199(100)
	others	23(40.351)	10(17.544)	24(42.105)	57(100)
	employed	22(14.667)	43(28.667)	85(56.667)	150(100)
	Total	800(33.33)	800(33.33)	800(33.33)	2400(100)
5	**Socio-economic status**				
	Class I	303(42.083)	378(52.5)	39(5.417)	720(100)
	Class II	358(35.516)	308(30.556)	342(33.929)	1008(100)
	Class III	139(20.685)	114(16.964)	419(62.351)	672(100)

	Total	800(33.33)	800(33.33)	800(33.33)	2400(100)

From the above **Table 1**, it is clear that equal no. of subjects were taken from each study area i.e. 800 (33.333%). Of the total 2400 subjects, 20% were examined from each index age group with equal proportion of male and female i.e. 50% each. Maximum No. of subjects were from Hindu (76.04%), Muslim (15.66%) and Budhist (8.2%). Cosidering the literacy status, highest percentage of primary and middle school (27.5%,) and higher percentage of population of primary school (27.5% and 26%) and lowest percentage of graduates and above were found (2.37). Occupationwise, out of the total 2400 subjects maximum were students (48.58%), housewife (29.08%) and dependent (12.54%). Socioeconomic status revealed maximum no.of subjects were from class I and II (72%) followed by class III (27.9%).

Table 2 : Association between Geographic Location and PERIODONTAL STATUS in study population

Sr.no.	**Geographic Location**	PERIDONTAL STATUS					
		0	**1 ,2**	**2 ,3,4**	**2,3,4,R**	**Total**	P value
1	Urban I	213(26.625)	294(36.75)	177(22.125)	116(14.5)	800(100)	X2= 154.662 P<0.001
2	Urban III	92(11.5)	392(49)	224(28)	92(11.5)	800(100)	
3	Rural	52(6.5)	386(48.25)	246(30.75)	116(14.5)	800(100)	
4	Total	357(14.875)	1072(44.66667)	647(26.95833)	324(13.5)	2400(100)	

It was seen from **Table 2** that prevalence of healthy periodontal tissue was found highest in urban I as compared to urban III and lowest was in rural area. Prevalence of calculus and shallow pocket was lowest in urban I than urban III and rural area. Prevalence of deep pocket was higher in rural than urban I and III.

Table 3: Association between socio demographic profile and PERIODONTAL STATUS of study population

Sr no	**Socio-demographic profile**	**PERIDONTAL STATUS**				**Total**	**P value**
		0	**1 ,2**	**2 ,3,4**	**2,3,4,R**		
1		**Sex**					

	Male	174(14.500)	540 (45.000)	321 (26.750)	165 (13.750)	1200 (100)	X2= 0.436 P>0.05
	Female	183(15.250)	532 (44.333)	326 (27.167)	159 (13.250)	1200 (100)	
	Total	357(14.875)	1072 (44.667)	647 (26.958)	324 (13.500)	2400 (100)	
2		**Age**					
	5-6	158(32.917)	322 (67.083)	0 (0.000)	0 (0.000)	480(100)	X2 = 1873.357 P<0.001
	12	112(23.333)	368 (76.667)	0 (0.000)	0 (0.000)	480(100)	
	15-18	51(10.625)	207 (43.125)	216 (45.000)	6(1.250)	480(100)	
	35-44	25(5.208)	140 (29.167)	268 (55.833)	47 (9.792)	480(100)	
	65+	11(2.292)	35(7.292)	163 (33.958)	271 (56.458)	480(100)	
	Total	357(14.875)	1072 (44.667)	647 (26.958)	324 (13.500)	2400 (100)	
3		**Religion**					
	Hindu	262(14.356)	799 (43.781)	528 (28.932)	236 (12.932)	1825 (100)	X2 = 71.069 P<0.001
	Muslim	69(18.351)	213 (56.649)	49 (13.032)	45 (11.968)	376(100)	
	Buddhist	26(13.065)	60(30.151)	70 (35.176)	43 (21.608)	199(100)	
	Total	357(14.875)	1072 (44.667)	647 (26.958)	324 (13.500)	2400 (100)	
4		**Literacy status**					

	Illiterate	7 (2.077)	44 (13.056)	178 (52.819)	108 (32.047)	337(100)	X2 = 727.67 P<0.001
	literate	7 (3.415)	47(22.927)	93 (45.366)	58 (28.293)	205(100)	
	primary school	151(22.879)	356 (53.939)	80 (12.121)	73 (11.061)	660(100)	
	middle school	123(19.712)	408 (65.385)	65 (10.417)	28 (4.487)	624(100)	
	high school	18(8.911)	57 (28.218)	93(46.04)	34 (16.832)	202(100)	
	intermediate or post high school certificate	34(12.274)	124 (44.765)	104 37.545)	15 (5.415)	277(100)	
	Graduate and above	17(17.895)	36 (37.895)	34 (35.789)	8 (8.421)	95(100)	
	Total	357(14.875)	1072 (44.667)	647 26.958)	324 (13.5)	2400 (100)	
5		**Occupation**					
	student	295(25.344)	793 (68.127)	74 (6.357)	2 (0.172)	1164 (100)	X2= 1753.98 P<0.001
	Dependent	10(3.322)	26 (8.638)	76 (25.249)	189 (62.791)	301(100)	
	Housewife	12(3.438)	120 (34.384)	178 (51.003)	39 (11.175)	349(100)	
	agricultural labour	8(4.444)	26(14.444)	119 66.111)	27 (15)	180(100)	
	own business	14(7.035)	54 (27.136)	111 55.779)	20(10.05)	199(100)	

	Others	4(7.018)	10 (17.544)	7 (12.281)	36 (63.158)	57(100)	
	employed	14(9.333)	43(28.667)	82 (54.667)	11 (7.333)	150(100)	
	Total	357(14.875)	1072 (44.667)	647 26.958)	324 (13.5)	2400 (100)	
6		**Socio-economic status**					
	Class I	168 (23.333)	293 (40.694)	178 24.722)	81 (11.25)	720(100)	X2= 111.508 P<0.001
	Class II	132 (13.095)	520 (51.587)	230 22.817)	126 (12.5)	1008 (100)	
	Class III	57 (8.482)	259 (38.542)	239 35.565)	117(17.411)	672(100)	
	Total	357(14.875)	1072 (44.667)	647 26.958)	324 (13.5)	2400 (100)	
7		**Habit**					
	finger Cleaning	185(13.899)	721 (54.17)	273 (20.511)	152 (11.42)	1331 (100)	X2= 295.639 P<0.001
	Brush Cleaning	149(21.016)	288 (40.621)	207 (29.196)	65 (9.168)	709 (100)	
	FTb*	10 (3.817)	38 (14.504)	130 (49.618)	84 (32.061)	262 (100)	
	BTb**	13 (13.265)	25 (25.51)	37 (37.755)	23(23.469)	98(100)	
	Total	357 14.875)	1072 (44.667)	647(26.958)	324 (13.5)	2400 (100)	

Table 3 shows that sex wise prevalence of PDD was found to be 85.5% in males and 84.75% in females. Age wise prevalence was found be highest in a 35-44 years age group i.e.94.792 % and lowest in 5 to 6 years age group i.e. 67.083%. In case of religion, Buddhist exhibited highest prevalence i.e. 86.935% whereas Muslims exhibited lowest prevalence of PDD i.e. 81.649% and. Literacy status revealed maximum prevalence in illiterate group 97.923%.

Among different occupations dependents exhibited highest 96.678% prevalence whereas students revealed lowest prevalence 74.656%. Prevalence of PDD was found to be highest in class III Socioeconomic status i.e. 91.518% and lowest in Class 1 i.e. 76.667%. Considering the teeth cleansing habit and habit of tobacco and betel nut chewing, the prevalence of PDD was found to be highest in persons with finger teeth cleansing and having tobacco and betel nut chewing habit.

It was observed that statistically significant difference in prevalence of PDD was seen in study area or geographic location. Males and females exhibited slight difference in prevalence of PDD which was not statistically significant (P>0.05). The difference was found statistically significant among different age groups, religion, literacy status, occupation, socio-economic status and habits.

Discussion

Health is of paramount importance in today's world. Presentation of disease- free dentition is a noble challenge, but unfortunately very few remain in this pristine state of health. As WHO says – the enjoyment of the highest attainable standards of health is one of the fundamental rights of every human being without distinction of race, religion, economic and social conditions.

Oral health being an integral component of general health status has a role in the improvement of quality of life. But the present status of dental diseases in the developing countries is apparently unable to change their epidemiological picture.

Among dental care management, periodontal disease is the most widely spread condition requiring special attention. To assess periodontal conditions, Community Periodontal Index of Treatment Needs (CPITN) was developed as a method in both epidemiological studies and general dental health practice. CPITN is an established index and has generated considerable data to identify periodontal conditions in different populations.[6] The use of this index although simple, quick and highly reproducible compared to the other indices used for evaluation of periodontal status the significance is less in older ages of life as it does not record the gingival recession.[7]

This study has assessed the periodontal status, associated with various risk factors that will provide an essential basis for promoting primary oral health care programs and will identify the areas wherein preventive measures can be applied to aid in the betterment of overall health of the population.

In the present study out of the total subjects, 14.87% of people were with healthy periodontal tissue. Higher percentage of people (44.66%) showed bleeding with calculus followed by shallow pocket with calculus (26.95) and 85.13% of people were affected with periodontal disease. Sachdev et al in their epidemiological study had shown out of 501 individuals examined, 92.8% of people had gingival and 79.8% had periodontal disease.[8] Nunn et al in their study found that 83% of adults had calculus, 12.7% had shallow pocket, 2.1% had deep pocket and 1.2% adults presented with bleeding on probing.[9]

Distribution of subjects as per study area showed that prevalence of healthy periodontal tissue was found high in urban I as compared to urban III and lowest in rural area. Prevalence of calculus and shallow pocket was lowest in urban I than urban III and rural area. Prevalence of deep pocket was higher in rural and urban I than in Urban III. That means prevalence of periodontal disease was found highest in rural areas (93.5%) compared to Urban III (88.5%) and Urban I (73.38%). Rao S et al also concluded in their studies that rural subjects are more likely than urban and tribal subjects to suffer from periodontal diseases (22.6% vs 10.5% and 15 % respectively).[10]

Considering the age factor, findings of our study revealed that, as age increases percentage of people with healthy periodontal tissue decreases. As age increases, severity of periodontal disease increases. Sachdev et al shown, gingival and periodontal disease increases with age. In their study, they have shown prevalence of periodontal disease in 3-10 years (34%) and 11-20 years (82%).[8] In all surveys where prevalence and severity have been assessed periodontal disease have been found to increase throughout life. High prevalence of gingivitis has been observed in both primary and permanent dentition of children, from 13 years and above the proportion of persons with periodontal pocket and alveolar bone loss increases. The prevalence of destructive diseases, follows a linear progression from adolescence to old age.[11] Strong correlation with age, probably reflects the commulative effect of the disease rather than the diminishing resistance of older people. D'Silva et al and Amid et al also had similar findings in their studies.[12,13]

Genderwise predilection revealed slightly high percentage of periodontitis in males compared to females. Vertak Urmila revealed the cause may be related to the habit of tobacco in males. Studies from 1962-65, 1971-74, 1985-86 also shown strong male predilection for periodontal disease than females.[14] Findings of studies of Madden I, Amid et al, Herald et al were consistent

with those of our studies.[6,13,15] In general we can see that females were periodontal healthier than their male counterpart.

Data was also analyzed for assessing the relationship between education, occupation and socioeconomic status. Prevalence of periodontal disease was found higher in illiterates, dependents and in low socioeconomic groups. Swarz et al also had shown that prevalence of periodontal disease was more in subjects with lower education.[16] Craig et al reported greater severity of periodontal pockets in unskilled and skilled workers compared to professionals among participants recruited in Newyork.[17] Kawaharada M et al in2001 related the difference in severity of periodontal disease to levels of sleep and occupational stress.[18] Doifode et al in their field survey found more prevalence in low socioeconomic status.[19] This could be attributed to inadequate knowledge about dental health, financial issues and inadequate services at government institutes. Studies done by Amid and Susan, Herald et al, D'Silva et al support our findings.[12,13,15] Sheiham A et al also revealed that socioeconomic status is a determinant of periodontal disease.[20]

Considering the teeth cleansing habit and habit of tobacco and betel nut chewing, the prevalence of PDD was found to be highest in persons with finger teeth cleansing and having tobacco and betel nut chewing habit. The results of the present study are similar to the findings of other studies, which showed that subjects with the habit of tobacco consumption in chewable forms and betel nut chewing had more sites with periodontal destruction, and further associated with loss of attachment and mobility.[21,22]

Conclusion: Thus periodontal disease is a major dental disease affecting almost two third of the population. Various contributing factors affect its severity. To reduce the disease burdon larger studies on larger data and major diagnostic and treatment camps should be executed.

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