

Prevalence of periodontal diseases among rural population of Mustabad, Krishna District

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Abstract

Aims and Objectives: People in rural areas neglect oral health as they lack awareness on dental diseases and also due to inadequate availability of dental services. The prevalence of illiteracy is also a reason which can be attributed to a poor oral health. This epidemiological study is undertaken to assess the prevalence of periodontal diseases in the rural population of Mustabad – in Krishna, Andhra Pradesh. **Materials and Methods:** A cross-sectional study based on randomized sampling method was carried out using the WHO assessment form (1997) on a population of 470. The data were subjected to statistical analysis using Statistical Package for Social Sciences Version 15.0. **Results:** The subjects were 220 males and 250 females. Maximum numbers of subjects were in the age group of 35–44 years (21.91%). Prevalence of periodontal disease was found to be 73.62%. The periodontal status deteriorated with aging. Prevalence of periodontitis was higher in females (56.35%) compared to males (43.65%). Males had a higher prevalence of deep pockets (3.18%), whereas females had a higher prevalence of shallow pockets (3.20%). Females had twice the bleeding tendency (18.80%) compared to males (8.64%). **Conclusion:** The increasing prevalence of periodontal diseases is an impending problem which needs immediate intervention, if not it would have a serious negative impact on the future oral health. The need of the hour is more epidemiological studies with a bigger sample are required.

Key words: Gender, oral health status, periodontal diseases, periodontitis, rural population

INTRODUCTION

Oral health is part of the overall health and has a significant impact on both the physical and psychological state. Generally, people in rural areas neglect oral health as they lack awareness on dental diseases and also due to inadequate availability of dental services. Another reason which could be attributed is percentage of illiteracy prevalent in the Indian population.^[1]

Periodontitis is one of the major reasons for tooth loss in adults. Periodontitis refers to chronic inflammatory diseases affecting the periodontal supporting tissues of teeth, inclusive of destructive as well as nondestructive diseases. Gingivitis refers to the milder form of periodontal diseases. It is a reversible form of periodontal disease which is nondestructive. Destructive periodontal diseases include most commonly chronic periodontitis, followed by periodontitis associated

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with systemic diseases, aggressive periodontitis, and necrotizing periodontal diseases.^[2]

According to Agarwal *et al.*,^[2] periodontal disease is more prevalent in the rural population due to the lack of a structured oral healthcare system with the dentist population ratio being at 1:2,00,000. The study was carried out in Modinagar, Uttar Pradesh.

Lack of health education, awareness and infrastructure, poor oral hygiene practices, tobacco use, alcohol consumption, and insufficient oral healthcare facilities are the main culprits behind the poor oral health among the rural population of India.^[3,4] Another point of concern is the very high prevalence of chronic inflammatory periodontal disease in the rural Indian population are left untreated.^[5] Hence, the prevalence rate of periodontal diseases in rural India is of great concern in public health dentistry.^[4]

Although literature shows that periodontal health of rural Indian population is poor, data on periodontal health status of the rural population in Andhra Pradesh is scarce.^[4] A cross-sectional survey for the prevalence of periodontal diseases helps to identify previous tissue destruction from the past diseases.^[6] This study aimed to assess the oral health status of Mustabad population. The study tries to assess the periodontal disease status among the rural population of Mustabad, Andhra Pradesh to evaluate the need for oral health care delivery to the affected population.

MATERIALS AND METHODS

This cross-sectional house to house survey was done in Mustabad a rural village in Krishna district, Andhra Pradesh, India, for a period of 6 months from the month of January until the end of June. Using the systematic random sampling method from a total of 4230 subjects, 470 subjects of age 13 years and more were selected as a sample. A sample size of 453 was required to test the hypothesis with 95% confidence interval and 80% power to reject the null hypothesis.

All the residents who were present at home on the days of the survey were included in the study while exclusion criteria comprised subjects who were systemically ill and unwilling to participate. Ethical approval was obtained from the Ethical Committee. Informed consent was obtained before the survey was initiated.

All patients were examined by three dentists participated in the examination of the selected sample. The

three examiners were calibrated to obtain uniform consensus. The examiners used a sterilized community periodontal index (CPI) probe and mouth mirror under standardized torch light. The CPI guidelines were followed for the purpose of evaluation of periodontal status. Ten index teeth 17, 16, 11, 26, 27, 37, 36, 31, 46, and 47 were examined to assess the periodontal status. Gingival bleeding, calculus, and periodontal pockets were the indicators of periodontal status. Pockets were grouped into shallow pockets of depth measuring 3–5 mm and deep pockets of depth measuring 6 mm or more than 6 mm.

Data were analyzed using Statistical Package for Social Sciences version 15.0. (IBM). Chi-square test was used to assess the difference between the dental caries prevalence according to age group and gender. One-way ANOVA was applied to assess the influence of age on dental caries experience.

RESULTS

Table 1 shows the distribution of the study population of 470 subjects of which 220 were males and 250 females. The maximum numbers of subjects were in the age group of 35–44 years (21.91%).

Table 2 represents the percentage distribution of study subjects according to age groups and periodontal status. Prevalence of periodontal disease was found to be 73.62%. Out of the total 470 subjects, 124 (26.38%) had healthy gingiva, 54.04% had calculus, 2.55% had shallow pockets, whereas 2.98% had deep pockets measuring more than 6 mm. The highest percentage of healthy periodontium was in the age group of 15–19, with 52.17% (24) subjects having normal periodontium. The periodontal status seemed to be degrading with the increasing age, with the highest prevalence of deep pockets in the age group of 55–64 (16.33%). The

Table 1: Distribution of study subjects according to age groups and gender

Age	Males, % (n)	Female, % (n)	Total	Percentage
13	0.00 (0)	1.60 (4)	4	0.85
14	0.45 (1)	3.20 (8)	9	1.91
15-19	12.27 (27)	7.60 (19)	46	9.79
20-24	11.36 (25)	20.40 (51)	76	16.17
25-29	12.27 (27)	15.20 (38)	65	13.83
30-34	9.09 (20)	7.60 (19)	39	8.30
35-44	23.18 (51)	20.80 (52)	103	21.91
45-54	13.18 (29)	11.60 (29)	58	12.34
55-64	10.91 (24)	10.00 (25)	49	10.43
65+	7.27 (16)	2.00 (5)	21	4.47
Total	100.00	100.00	470	100.00

Chi-square value was 128.7340, with the significance level of 5% ($P < 0.05$).

Table 3 gives the comparison of periodontal status between men and women. Periodontal status was better in males than females. Out of total 470 subjects, 220 were males and the remaining 250 were females. The higher proportions of males had healthy gingiva (31.36%) than females (22.00%). Males had a higher prevalence of deep pockets, (3.18%) whereas females had a higher prevalence of shallow pockets (3.20%). Females had twice the bleeding tendency (18.80%) compared to males (8.64%).

Table 4 gives the measure of loss of attachment in subjects with CPI scores of 3 and 4. Loss of attachment was 0–3 mm in 38.46%, 4–5 mm in 57.69%,

and >6 mm in 3.85%. Prevalence of loss of attachment was higher in the age group of 55–64 years (38.46%), followed by 45–54 years (26.92%), and least in subjects of age >64 years (11.54%).

DISCUSSION

In this study of people who were representative of Mustabad population of age above 13 years, it could be deduced that rural residency influences a person oral health status. Adults living in rural areas were more likely to experience dental caries and periodontal diseases. Similar findings were observed in various epidemiological studies.^[3,7] These findings may reflect combination of inadequate availability and access to timely dental care. The level of education has also been ascribed as a factor for the prevalence of periodontal disease.^[8]

Table 2: Percentage distribution of study subjects according to age groups and periodontal status community periodontal index

Age (in years)	Healthy	Percentage	Bleeding	Percentage	Calculus	Percentage	Shallow pocket	Percentage	Deep pocket	Percentage	Total
13	2	50.00	2	50.00	0	0.00	0	0.00	0	0.00	4
14	2	22.22	0	0.00	7	77.78	0	0.00	0	0.00	9
15-19	24	52.17	5	10.87	17	36.96	0	0.00	0	0.00	46
20-24	18	23.68	22	28.95	36	47.37	0	0.00	0	0.00	76
25-29	14	21.54	15	23.08	36	55.38	0	0.00	0	0.00	65
30-34	11	28.21	6	15.38	22	56.41	0	0.00	0	0.00	39
35-44	22	21.36	8	7.77	67	65.05	6	5.83	0	0.00	103
45-54	14	24.14	1	1.72	36	62.07	1	1.72	6	10.34	58
55-64	12	24.49	5	10.20	22	44.90	2	4.08	8	16.33	49
65+	5	23.81	2	9.52	11	52.38	3	14.29	0	0.00	21
Total	124	26.38	66	14.04	254	54.04	12	2.55	14	2.98	470

$\chi^2=128.7340$, $df=36$, $P=0.00000^*$

*Significant at 5% level of significance ($P<0.05$)

Table 3: Percentage distribution of study subjects according to gender and periodontal status Community Periodontal Index

Gender	Healthy	Percentage	Bleeding	Percentage	Calculus	Percentage	Shallow pocket	Percentage	Deep pocket	Percentage	Total
Male	69	31.36	19	8.64	121	55.00	4	1.82	7	3.18	220
Female	55	22.00	47	18.80	133	53.20	8	3.20	7	2.80	250
Total	124	26.38	66	14.04	254	54.04	12	2.55	14	2.98	470

$\chi^2=13.5001$, $df=4$, $P=0.0090^*$

*Significant at 5% level of significance ($P<0.05$)

Table 4: Distribution of study subjects according to age groups and loss of attachment

Age (in years)	0-3 mm	Percentage	4-5 mm	Percentage	6-8 mm	Percentage	Total
35-44	5	83.33	1	16.67	0	0.00	6
45-54	2	28.57	5	71.43	0	0.00	7
55-64	1	10.00	9	90.00	0	0.00	10
65+	2	66.67	0	0.00	1	33.33	3
Total	10	38.46	15	57.69	1	3.85	26

Prevalence of gingivitis and periodontitis was comparatively lesser in the subjects of lesser age group, similar to the findings of Singh, who reported the overall prevalence of gingivitis and periodontitis as 77.52% and 16.03%, respectively, among school children of 8–17 years of age in Lucknow region of Uttar Pradesh, India.^[8] The extent and severity of periodontal diseases followed a general trend observed in the majority of the studies, i.e., direct proportionality between the age and prevalence of periodontal diseases. This could be due to changes in the host immunity against disease process with aging, which occurs naturally. Another plausible explanation could be the cumulative effect of untreated disease processes over a period of time.^[9,10]

The prevalence of periodontal pockets was observed to be higher in males though females had a higher prevalence of periodontitis. The findings are analogous to the study conducted by Grewal^[11] and another study on oral health status of Malaysian adults.^[12] The higher prevalence of deep periodontal pockets among men may be due to their higher indulgence in adverse oral habits when compared to women.^[2,13,14] Higher periodontal disease rate among females could be attributed to poor nutrition, hormonal imbalance, and frequent childbirths.^[15] With contradicting views, Shaju *et al.*,^[16] Rao *et al.*,^[17] and Nanaiah *et al.* had reported that periodontal health was shown to be better in females as they are generally more health conscious.^[15-19] As the results depend on several factors such as study designs, sample size, eligibility criteria, recording of data, criteria for assessment of disease, microbial pathogens, disease activity, and multifactorial nature of periodontal diseases including age, gender, socioeconomic status, educational status, stress, and genetic factors, it is difficult to compare these observational studies.^[9]

Higher bleeding tendency in females (18.64%) could be attributed to the presence of calculus (53.2%). Although males had a significantly greater incidence of calculus (55.00%), they displayed a significantly lower bleeding occurrence (8.64%) than females. Decreased bleeding in males could be due to their indulgence in adverse oral habits such as smoking. As suggested in several studies that in smokers with periodontitis, gingival bleeding is reduced when measured by probing with a pressure of 60 g.^[20]

The loss of attachment gradually increased with age. The findings were similar to the study conducted by Papapanou *et al.*, they tried to assess whether

age-related changes in periodontium manifested as loss of probing attachment and alveolar bone. The results showed that attachment loss increased with age, but a higher proportion of subjects had no attachment or alveolar bone loss. Thus, suggested that loss of probing attachment or alveolar bone may not inevitably manifest as age-related alterations in the periodontium.^[21] The prevalence of loss of attachment in the age group of 35–54 years was 65.38%, analogous to the study conducted by Do *et al.*, stating higher prevalence of loss of attachment among middle-aged adults.^[22]

The study summarized that the prevalence of gingivitis was less in population with less age. It showed that loss of attachment gradually increases with age. Females showed higher bleeding tendency and periodontitis. The males showed a higher percentage of calculus and periodontal pocket formation.

The study was carried out in a wide array of population and had given a significant result. Batra *et al.*^[23] suggested that a community-based approach can be designed to overcome this high prevalence in the rural population of India. However, the study would have had much more validity if it was carried out in much wider area of rural population.

Recent advances in periodontal diseases, etiology, and epidemiology have been reported^[24] but still future research should be focusing on the preventive aspects of periodontal diseases as it is a chronic disease and once it is initiated the effects are irreversible. The onus needs to be targeting the female population as the survey showed a predilection toward them.

CONCLUSION

Improving access to dental care and increasing dental care utilization in rural areas is definitely required. If progress is to be made toward increasing tooth retention and improving oral health in rural areas, additional research in dental health services and disease prevention needs to be undertaken. The focus has to be on the specific target population to achieve a desired result and thus an improved future for oral health.

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Conflicts of interest

There are no conflicts of interest.

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