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ORIGINAL RESEARCH

Effect of Tobacco Habits on the Periodontal Status in Indian Rural Population of Northern Maharashtra - An Epidemiological Study

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ABSTRACT

Aims and Background: Adverse effects of varieties of culturally integrated form of tobacco on periodontium have been studied in the recent era. This cross-sectional study was aimed at possible relationships between the effects of different tobacco habits on periodontal status in the rural population of Western Maharashtra. **Materials and Methods:** This study comprised of total 5006 subjects (Male-3590; Females-1416). Clinical examination comprised of an intra-oral examination with specific emphasise to attachment loss, pocket depth, mobility, furcation involvement and subject to a detailed questionnaire in order to obtain information regarding the tobacco habits. **Results:** Results shows that tobacco users have more severe periodontitis as compared to non-users. Mishri (type of smokeless tobacco) is commonly used as an oral hygiene practice. Logistic regression analysis, after adjusting for Oral hygiene index-simplified, further proves a strong correlation between tobacco usage and periodontitis. Interesting finding is that in this rural population smokeless tobacco habit is more as compared to smoking tobacco habit. **Conclusion:** The findings of this study highlight the importance of stoppage of tobacco habit to improve periodontal health status among the rural population in India. **Clinical significance:** Proper implementation of law and patient's education regarding ill effects of tobacco and proper tooth brushing techniques are required.

Keywords: Tobacco, Periodontitis, Mishri, Smokeless tobacco, Snuff Tobacco.

INTRODUCTION

In India tobacco consumption has been considered to be a major contributor to the total mortality rate. World Health Organization (WHO) assessment estimated that by 2030 tobacco related death may exceed 1.8 million annually or 15% of all deaths in India.[1,2] The total number of smokeless tobacco users in India and Pakistan has been estimated to be around 100 million.[3] It is well known that tobacco consumption is also related to oral pre-cancer, oral cancer, oral candidiasis, periodontal disease, implant failure and dental caries.[2] Periodontitis is the most common type of periodontal disease which is strongly associated with tobacco use. Various etiological

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factors have been proposed that are responsible for periodontitis including plaque, calculus, systemic diseases and habits like smoking, betel nut and tobacco chewing.[2] Likewise, there is strong evidence that tobacco use has numerous negative effects on oral health, for example, staining of teeth and dental restorations, reduction of the ability to smell and taste, development of oral diseases such as smokers' palate, smokers' melanosis and coated tongue.[2,3] Major systemic adverse effects of tobacco consumption include various form of cancer (mainly lung cancer) and various forms of cardiovascular diseases.[2] The reasons for the initiation of tobacco use in India are many. Varieties of culturally integrated forms of tobacco are available in India. The aim of present cross sectional study was to contribute to better understanding of the relation between type of tobacco habits and incidence of periodontitis in randomly selected patients, who visited central OPD (Outpatient Department) of the institution. This study also checked for the prevalence of smoking / smokeless form of tobacco in various age groups and analysed tobacco usage with respect to occupation and gender variations.

MATERIALS AND METHOD

Present Descriptive Epidemiological study consisted of randomly selected 5006 rural patients [3590 males and 1416 females] aged between 18-80 years. Study was approved by the institutional ethical committee. The patients were examined in central OPD (Outpatient Department). The only exclusion criterion was the presence of any systemic disease. Examination protocol consisted of two parts, a self-administered questionnaire and clinical examination. The questionnaire was designed to assess knowledge, attitude, and behaviour relating to dental health, as well as obtaining information on the tobacco habits of each patient. Clinical examination comprised an intraoral examination with specific emphasis to periodontal examination which included the assessment of clinical attachment loss (CAL), probing depth (PD), mobility and furcation involvement. Oral hygiene index was measured to record the overall oral hygiene of an individual.

Questionnaire

Personal data (Age, Sex and Occupation), oral health behaviour (type of brush, dentifrice, frequency) and information regarding tobacco habits (type of tobacco, duration, frequency) of patients were assessed by using a questionnaire consisting of validated questions.

Intraoral Examination

Intraoral examination includes assessment of oral hygiene and completes periodontal examination. Oral hygiene was assessed by oral hygiene index-Simplified. Complete periodontal examination included the assessment of CAL, PD, mobility, recession and furcation involvement.

Statistical Analysis

Data was analyzed statistically by Chi-Square Test and Logistic regression-analysis.

[Statistical software used: The Statistical software namely SAS 9.2, SPSS 15.0, Stata 10.1, MedCalc 9.0.1,Systat 12.0 and R environment ver.2.11.1 were used for the analysis of the data and Microsoft word and Excel have been used to generate graphs, tables etc.]

RESULTS

This study shows that out of 5006 subjects 4208 were tobacco users of which 4172 had some form of periodontitis, accounting for 99.1% and out of 798 non-tobacco users only 37 had periodontitis, accounting for meagre 4.7%, suggesting a definite, statistically significant association between tobacco usage and periodontitis.[Table-I]

Further analysis between correlation of tobacco habits & severity of periodontitis shows that out of total tobacco users 76.1% had severe periodontitis whereas, 22.1% had moderate and only 0.9% had mild periodontitis. (Classification of severity is based on international workshop for classification of periodontal diseases, 1999).[4] On the contrary, out of non-tobacco users only 1.2% showed severe periodontitis and 3.5% had moderate periodontitis. Remaining 99.3% showed only signs of gingivitis. In tobacco users only 0.9% had gingivitis.

Logistic regression analysis, after adjusting for Oral hygiene index-simplified, further proves a strong correlation between tobacco usage and periodontitis with adjusted Odds ratio of 1496.0. [Table-II]

Occupational data suggests that higher prevalence of tobacco use was seen among farmers (96.5%), workers (96.1%). When dentifrices were compared mishri was found to have 95% severe periodontitis prevalence.

Table- I. Correlation of Tobacco habits and Periodontitis

Periodontitis	No tobacco use		Tobacco use	
	No	%	No	%
Absent	761	95.3	36	0.95
Present	37	4.7	4172	99.1
Total	798	100.0	4208	100.0
Inference	Incidence of Periodontitis is significantly associated with tobacco use with $P<0.001$**			

**: Strongly significant

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Table-II. Logistic Regression Analysis

Variables	Logit co-efficient	*P* value	Adj OR
OHI	0.959	0.394	2.61
Tobacco	7.311	<0.001**	1496.0

**: Strongly Significant

DISCUSSION

India is a country with almost 72% of the population living in rural areas with diverse lifestyles. The present study was carried out in the rural areas of Northen Maharashtra which are prone for misconceptions regarding the use of tobacco for their oral hygiene practice. Mishri is one form of smokeless burnt tobacco which is commonly used as a dentifrice in rural areas of Northen Maharashtra. It is a black powder obtained by roasting and grinding tobacco on a hot metal plate until it is uniformly black.

In this epidemiological study out of total study population 83% had some sort of tobacco habits which is much more as compared to 65.6% in National Survey of India.[3] Also in this population 86.4% men & 70.1% women had smokeless tobacco habit which is much more as compared to 7-34% for men & 8-18% for women, finding reported for the north area in national survey by Rani et al.[3] We found that application of mishri (23.5%) was highest followed by tobacco chewing (21.3%). Whereas previous studies in urban population showed that prevalence of Mawa-masala (63.7%)[5] Gutkha (57.6%)[5] and Betel quid with tobacco (27.1%)[6] was highest. However, it is interesting to note that in our rural population cigarette smoking was least (0.6%) for men and (0%) for women with no bidi smoking in either men or women. In contrast Gupta V[7] and Fabio RM[8] showed that in rural population 44.6% men and 11% women reported exclusively bidi smoking.

Tobacco users were highest in age group of 51-60 years with the mean age of 41.76±14.54 these results are similar to the studies done by Sajith et al[2] and Urvish et al[5] who states that tobacco users were highest in 45-55 years of age group (76.1%) with the mean age of 47.29. In our sample population, higher prevalence of tobacco habits was found among farmers (96.5%), workers (96.1%) followed by housewives (60%).

Tobacco is a proven risk factor for periodontitis. In our study 99.1% of tobacco users had periodontitis out of which 76% had severe and 21% had moderate periodontits. Logistic regression analysis by nullifying the effect of oral hygiene on the periodontitis gives the clear idea about the effect of only tobacco habit on the development of periodontitis. These results are in accordance with Parmar et al[9] who reported that chewing quid comprised of tobacco and areca nut has adverse effect on the periodontal tissues resulting in the loss of attachment in Ahmadabad, India. Whereas Sumanth et al[10] found that pan chewers with tobacco had 4.7 times more risk of having pockets and seven times more risk of having loss of attachment than pan chewers without tobacco. In contrast one study reported that smokeless tobacco chewers experienced a slightly higher incidence of periodontal disease than non-chewers, but the difference was not significant.[11]

In this study the prevalence for use of pure mishri, as an oral hygiene aid was noticed more in females (63.3%) as compared to males (7.2%). Gupta[14] also reported similar findings with prevalence of 39% in females. Mani et al reported that use duration of mishri application is directly praporional to the clinical attachment loss of periodontium.[12]

Our study suggests a definite correlation between use of mishri as dentrifrice and periodontitis and also a strong correlation between smokeless tobacco habits and the severity of periodontitis.

CONCLUSION

The findings of this study highlight the importance of stoppage of tobacco habit to improve periodontal health status among the rural population in India. Proper implementation of law and patient's education regarding ill effects of mishri and proper tooth brushing techniques are required.

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