RESEARCH ARTICLE

A COMPARATIVE STUDY TO EVALUATE THE PERIODONTAL HEALTH STATUS AMONG SMOKERS AND SMOKELESS TOBACCO USERS: A PILOT STUDY

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ABSTRACT

Aim: The aim of this cross-sectional study is to assess the general periodontal health status of smokers as well as of smokeless tobacco users. *Materials and Methods:* The study population consists of patients aged between 22-50 years and are divided randomly into 4 groups i.e. Group-I consists of all current smokers as far CDC (Centre for disease control and Prevention Classification) , Group-II – includes use of smokeless tobacco in any forms more than 1 packet of any form of smokeless tobacco, Group III- consists of both smokers and smokeless tobacco users and Group-IV-includes use of different types of smokless tobacco products for brushing teeth . The periodontal status are evaluated for all of these groups by Oral hygiene index-Simplified(OHI-S) using 23 explorer and Community Periodontal index criteria (CPI) using 621 WHO probe. *Results:* The results are statistically compiled and mean of oral hygiene index of Group I- is (4.1±1.28), Group- II-(4.3±1.23), Group-III-(4.8±1.02), Group- IV-(4.4±1.36) which is quite similar in all groups and statistically insignificant . The percentage of CPI codes are as follows for code -0, code-1, code-2,code-3 and code-4 are 24, 31.9, 34.4, 28.75, 8.125 percent respectively for all groups which shows that prevalence of code-2 is more common among this study population. *Conclusion:* It is found that the tobacco in any forms whether smoking or smokeless tobacco has detrimental effects on the health of periodontium. The deleterious influence of tobacco depends upon the type, frequency and duration of the tobacco use.

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INTRODUCTION

Smoking tobacco or use of smokeless tobacco products remains the most extensively used addiction among global population with India being the third largest producer of tobacco and second largest consumer of tobacco in the whole world with mortality of 1.3 million. Out of these, khaini remains the most commonly used tobacco product in India followed by biddi and gutka.(GATS-2016-17) Tobacco is the single preventable cause of several systemic and oral diseases like cancer, cardiovascular diseases, chronic obstructive diseases and periodontal diseases.[1] Periodontal diseases are the multifactorial polymicrobial infectious diseases that are affecting about 90 percent of population worldwide. Among the other systemic and local modifiable risk factors, tobacco is one of them that alters the severity, treatment and prognosis of oral diseases. Smoking is known to alter the immune cell function by decrease in proinflammatory cytokines and chemokines and alteration of subgingival microbial niche.[2] There are several tobacco products that are used in the eastern India with smokeless tobacco being the most commonly used products like khaini,

gutka, taamg and paan i.e. which are placed directly into vestibule before ingestion and is shown to produce gingival recession and attachment loss.[3]Smoking either cigarette and biddis are also the major contributing factors for bone loss and attachment loss in the periodontium.[3] Besides, that there is popular habit of using smokeless tobacco like Gul, Gurrakku, Taamg for brushing teeth especially among elderly females that is also associated with gingival recession and attachment loss. In this study we are going to assess the periodontal health status among smokers and smokeless tobacco users.

MATERIAL AND METHOD

The study compromises of 200 patients out of 160 patients between the age group of 22-50 years are selected randomly from the OPD of department of Periodontics of our institution. The inclusion and exclusion criteria are described as follows:

Inclusion criteria

- Patient with full complement set of dentition.
- Patient who are using tobacco in any forms.
- Both male and female are equally considered.
- Patient is systemically healthy free from any systemic diseases.

Exclusion criteria

- Patient having a history of systemic diseases and under medications
- Patient having a history of pregnancy or breastfeeding
- Patient has undergone any periodontal treatment within last 2years.

Based on the usage of type of tobacco, the study population is divided into four categories i.e. Group-I- consists of all current smokers as far CDC (Centre for disease control and Prevention Classification) , Group-II – includes use of smokeless tobacco in any forms using atleast 1 packet of any form of smokeless tobacco, Group-III- consists of both smokers and smokeless tobacco users and Group IV- includes use of different forms of smokeless tobacco for brushing teeth. The study protocol was approved by the institution ethical committee and informed consent is signed by the patients who are interested to participate in the study. After type and purpose of the study is explained, all the patients who voluntarily participated in the pilot study are presented with a closed ended questionnaire compromising patients informations about their personal details such as name, age, gender, occupation, demographic details, socioeconomic status ,oral hygiene measures and deleterious oral habits advocated by them and intraoral examination was carried out by using by Oral hygiene index-Simplified(OHI-S) using mouth mirror ,23 explorer and Community Periodontal index of treatment needs (CPITN) using CPITN probe(Figure 1 & Figure 2).

Statistical analysis

The data collected are compiled statistically by using statistical SPPS version 17.0 (Statistical software for Social Science, IBM Corporation, USA) and Ms excel. Descriptive and inferential statistical analysis has been carried out by analysis of variance(ANOVA) to compare different parameters among three groups and descriptive parameters like mean, frequency and standard deviation are calculated from Ms excel.

Result& Observation: The present pilot study was conducted among 160 adults within the age group of 22-50 years which are divided equally into 4 groups.

Prevalence of different type of tobacco products: Table 1depicts the prevalence of different types of tobacco products consumed by the study population. Smokeless tobacco consumption is more common in the Eastern India compromising about more than 50 percent.

Demographic characteristics: The mean age of tobacco consumption is also similar and no statistical difference is present among four groups as illustrated in the Table 2. Majority of tobacco consumers are found to be males and belongs from lower socioeconomic strata of the society.

Although, significant amount of tobacco awareness is present among the study population but it has no or trivial effect on the attitude of the participants about tobacco cessation.

Figure 1. Showing Oral hygiene index-simplified measurement using mouth mirror and explorer among study participants
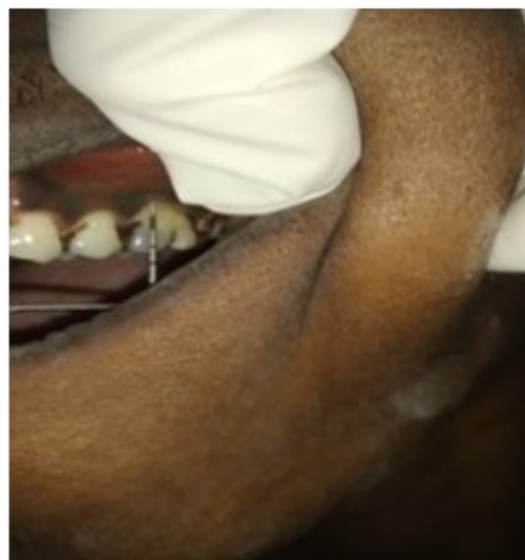

Figure 2. Showing assessment of periodontal health status among research participants using WHO probe

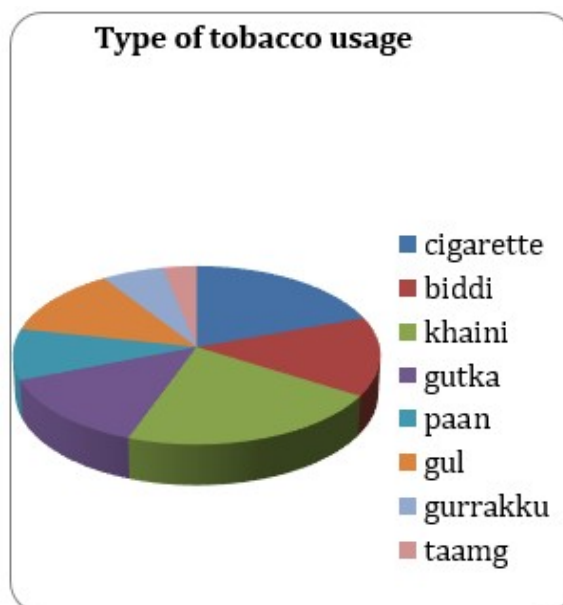**Table 1 depicts usage of different tobacco products.**

Table 2 depicts the age, gender, socioeconomic status and tobacco awareness distribution among study population

Parameters	Group-I (n=40)	Group-II (n=40)	Group-III N=40	Group-IV (n=40)	Total N=160
Age group					
22-30yrs	25(15.65%)	16(10%)	17(10.6%)	7(4.3%)	58(36.25%)
30-40yrs	10(6.25%)	18(11.25%)	13(8.12%)	17(10.6%)	67(41.9%)
40-50yrs	5(3.125%)	5(3.125%)	10(6.25%)	15(9.4%)	35(22.9%)
Total	40	40	40	40	160
Gender					
Male	37(23.1%)	39(24.4%)	40(25%)	20(12.5%)	136(85%)
Female	3(1.9%)	1(0.62%)	0	20(12.5%)	24(15%)
Total	40	40	40	40	160
Socioeconomic status					
APL	17(10.6%)	4(2.5%)	4(2.5%)	0	25(15.6%)
BPL	23(14.3%)	36	36(22.5%)	40(25%)	135(84.4%)
Total	40	40	40	40	160
Tobacco awareness					
Present	30(18.7%)	24(15%)	17(10.6%)	12(7.5%)	104(65%)
Absent	10(6.25%)	16(1%)	23(14.4%)	28(1.7%)	56
Total	40	40	40	40	160

Frequency and duration of tobacco consumption: The frequency of tobacco consumption is shown in the table-3 which elucidates that mean frequency of tobacco consumption of group-I, II, III and IV are 6.46,5.9,8.34,3.5 respectively and no statistical difference is noted (p=0.32) among the four groups. The duration of tobacco usage is of paramount interest and the mean duration of tobacco consumption for group-I, II,III and IV are 13.34,1.5,15,1 years and no statistical significance is noticed among the respective groups. (p<1) as illustrated from table-3.

Table 3. Shows frequency and duration of habits among groups

Parameters	Group-I	Group-II	Group-III	Group-IV
Frequency/day(p=0.3171)				
1-5 times	26	27	13	38
5-10times	8	6	17	2
10 and above	6	7	10	0
Mean	6.46	5.9	8.34	3.5
Duration in years	p=0.5			
0-1yrs	3	2	0	3
2-5yrs	16	17	11	7
5-10yrs	10	8	9	9
10 and above	12	13	20	17
Mean	13.34	1.5	15	1

Table 4. Shows that OHI-S among different groups and comparison of OHI-S with group-IV study population

OHI-S	Group-I	Group-II	Group-III	Group-IV
1-2	11	2	0	1
3-4	15	21	26	17
5-6	14	17	14	22
Total	40	40	40	40
Tobacco used for brushing				
Frequency	Gul	Gurrakku	Taamg	OHI-S
1 times	6	2	2	3.3
2-3times	7	6	2	4.3
Above 3 times	10	3	2	5.6
Total	23	11	6	4.4

Table 5. Depicts the CPI scores for all the four groups

CPITN codes	Group-I	Group-II	Group-III	Group-IV	Total
0(healthy)	10	10	0	4	24(15%)
1(bleeding on probing)	18	11	10	12	51(31.9%)
2 (presence of calculus)	15	9	11	20	55(34.4%)
3 (Pocket depth of 3-4mm)	6	9	23	8	46(28.75%)
4(pocket depth of 6mm and above)	1	1	6	5	13(8.125%)

Oral health indicators: The oral hygiene index simplified is used to assessed among different groups and mean for each groups are as shown in the table-4 which shows that Group-I and II has better oral hygiene than group-III and IV users .The most common tobacco products used for brushing are Gul but it has shown that all these products reduces the efficacy of brushing and thus causes more plaque accumulation which facilitates the progression of periodontal disease. Higher the frequency of using tobacco based products for brushing more compromised oral hygiene is noticed among the study population.

Periodontal health indicators: The CPITN(Community Periodontal index of treatment needs) criterias are used to assess the periodontal health among the study population as shown in table -5. The periodontal health status is jeopardized by the use of tobacco in any forms and it is quite evident from the current study which shows that percentage of code-0,1,2,3,4 are approximately close to 15,32,34,29,8 percent respectively.

DISCUSSION

The present pilot study aims to augment the existing knowledge of deleterious effect of tobacco on the health of the periodontium. In the light of this current study it is found that khaini is the most commonly used tobacco products followed by cigarette which is approximately 22 and 20 percent respectively in the study population which bears

close resemblance with GATS-2 report.[1] The prevalence rate of tobacco smoking is more common among younger adults (25 percent) i.e. within the age limit of 22-30 years in comparison to middle aged groups where smokeless tobacco consumption is more common which is about 18 percent which is comparable with the results of Thakur et al where smoking habit was 12 percent higher than national average of 6.4 percent .[4] Tobacco smoking is more evident in male subjects than in female subjects which is about 85 percent in males in comparison with 15 percent of female which is in accordance with study of Petkarp et al in which 92.8% where males and 7. 2 percent are females.[5] But in the current study, it is highlighted that elderly females are more using smokeless tobacco for brushing teeth which is about 12.5 percent . This emphasis that tobacco consumption is a male dominated habit in India and tobacco usage by females is not accepted culturally. Socioeconomic status is a major risk factor that is directly linked with the tobacco usage. In the present study, it is seen that people who are BPL(Below Poverty line) cardholders are more related to tobacco consumption than APL (Above Poverty Line) cardholders which is also being proved from the study of Thakur et al which prompt us to conclude that lack of literacy and awareness is the main reason.[6] But astonishingly, about 65 percent respondents are aware of the tobacco labelling in the recent survey but there is indifference in attitude about the deleterious effects of tobacco which is comparable with Francis et al study where 48 percent adult smokers believes that they can continue their habit for few years without any adverse effect on health.[7] The severity of periodontal disease depends upon lot of factors like frequency and duration of tobacco uses. In the present study, the mean frequency and duration of habit is correlated with the health of the periodontal status i.e. Group-III has maximum frequency and duration of tobacco consumption that corresponds with the increased CPI codes of 3 and 4 which is comparable with the study by Wickholm et al.[8]

In the current study, the oral hygiene index-simplified for all group are not statistically significant but Group-III shows more compromised oral hygiene index in comparison with others as compared with the study of Sreedevi et al.[9] But it is also seen in the study that frequency of brushing with tobacco products is directly linked with compromised oral hygiene index which elucidates that use of tobacco products with hand hampers the oral hygiene of the subjects and also leads to more plaque accumulation thereby facilitating the progression of periodontal diseases. The prevalence of CPI Code 2 is more common among this study population while presence of pocket is more common in Group-III which signifies deleterious effect of tobacco consumption in terms of frequency and duration on the health of periodontium. In contrast to that, Group-IV shows more code-2 which means more calculus and plaque accumulation which is attributed due to reduced efficiency of using hand as means of brushing than toothbrush. But Group-I and II does not show any significant difference statistically which is comparable to the study by Yaraganiet al.[10] The study population is relatively small which is the main drawback of this study due to several patient constraints.

CONCLUSION

The present study highlights the deleterious influence of tobacco consumption both smoking and smokeless tobacco products in the health of the periodontium. It is quite astonishing to note that patients are found to be careless and negligent about their oral health although they are aware of the tobacco labels and injurious effect of tobacco. Although, the present study do help us to augment our knowledge but more studies are required on large scale to assess the influence of tobacco consumption on oral health.

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