Journal of Pharmaceutical Research International

33(43B): 107-113, 2021; Article no.JPRI.73595
ISSN: 2456-9119
(Past name: British Journal of Pharmaceutical Research, Past ISSN: 2231-2919, NLM ID: 101631759)

Association between Chewable Tobacco Consumption and Oral Hygiene Habits on Periodontal Health

Moomal Memon[1], Shazia Shaikh[1], Muhammad Ilyas Siddiqui[1], Sikander Munir Memon[2*], Aosaf Anwar[3] and Eshnawar Ishaque[3]

[1]Faculty of Community Medicine and Public Health Sciences, Liaquat University of Medical and Health Sciences, Jamshoro, Pakistan.
[2]Medical Research Center, Liaquat University of Medical and Health Sciences Jamshoro, Pakistan.
[3]Institute of Dentistry, Liaquat University of Medical and Health Sciences Jamshoro, Pakistan.

Authors' contributions

This work was carried out in collaboration among all authors. Authors MM, IS and SS designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Author SMM managed the analyses of the study. Authors AA and EI managed the literature searches. All authors read and approved the final manuscript. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/JPRI/2021/v33i43B32531
Editor(s):
(1) Dr. Thomas F. George, University of Missouri- St. Louis, USA.
Reviewers:
(1) Sheetal Barde, Symbiosis International (Deemed) University, India.
(2) Methaq Hadi Lafta, Iraqi Ministry of Education, Iraq.
Complete Peer review History: https://www.sdiarticle4.com/review-history/73595

Original Research Article

Received 27 June 2021
Accepted 03 September 2021
Published 09 September 2021

ABSTRACT

Aims: To determine the pattern of chewable tobacco habits, to assess the oral hygiene habits among patients visiting dental OPD and to determine the association of oral health maintenance and chewable tobacco with severity of periodontal disease.
Study Design: It was a comparative cross sectional study.
Place and Duration of Study: Dental Outpatient Department, Liaquat University Hospital Hyderabad and Jamshoro for six months from 1st February 2020 to 31st July 2020.
Methodology: A total of 362 subjects were selected by non-probability sampling technique. A pre-designed questionnaire was used to collect the data. Questionnaire forms was close and open ended. The investigator checked the patients, under the supervision of the OPD specialist and

**Corresponding author: E-mail: drsikandermemon@gmail.com, drsikander.memon@lumhs.edu.pk;*

classified the periodontal health status. Statistical package for social sciences (SPSS v.22) was used for data analysis.
Results: A total of 362 subjects, (84.5%) male and (15.5%) females were included in the study with the mean age 34.9 and SD ± 11.7. A highly significant association was found between chewable tobacco consumption and oral hygiene habits on periodontal health (p=<0.001) and statistically significant difference was found between the scores of measure of probing depth and loss of attachment for male and females (p=<0.001).
Conclusion: Periodontal diseases and poor oral hygiene have been diagnosed in all consumers of chewable tobacco. Usage of various types of chewing tobacco has been found to exacerbate the condition by developing pocket formation, bleeding on the probe, and inducing gingival recession as well.

Keywords: Chewable tobacco; loss of attachment; oral hygiene habits; probing depth; periodontal health; periodontal diseases.

1. INTRODUCTION

Epidemiological studies have made it well known that the use of tobacco products in general is a substantial preventable risk factor for the onset and development of periodontal diseases. Periodontitis, with a prevalence of 11.2%, is the most common oral disease worldwide [1,2].

Periodontal disease is a chronic inflammatory periodontium disease and its progressive form is categorized by periodontal ligament weakening and underlying alveolar bone loss [3,4]. It is a multifactorial disease with risk factors such as genetics, age, stress and lifestyle variables, such as bad oral hygiene, alcohol consumption and smoking. Often included as a risk factor are diseases and harmful conditions such as metabolic syndrome, osteoporosis, obesity, diabetes mellitus, vitamin D and insufficient calcium in the diet [5].

One of the most substantial risk factors for periodontal disease is chewing tobacco. There are a multitude of chewing items available in Asian countries, such as India and Bangladesh, such as betel quid with tobacco, zarda, gutka, mawa and khainii [6,7]. Unlike smoking, the role of oral chewable tobacco in the etiology of periodontal disease has established far less attention [8].

Periodontal disorder and multiple clinical manifestations have an infectious and inflammatory aspect. Its etiologic agent is an oral biofilm, a thick, non-mineralized, highly structured complex mass of bacterial colonies in a gel-like antimicrobial matrix. Its presence and severity depend on the structure of the biofilm as well as environmental and acquired variables, and also on the susceptibility of each individual [9].

In both developed and developing countries, periodontal diseases are prevalent and affect about 20-50% of the worlds population. Depending on the concept of periodontitis and the research population, the incidence of periodontal diseases differs in various parts of the world, and it is observed that they may be more common in developing countries than in developed ones [10].

Dental caries and 20% of periodontal disease worldwide have infected 60 to 90% of school children and almost all adults, according to the World Health Organization report. In Pakistan, in terms of their oral health, people living in rural areas are at a disadvantage, mostly due to a shortage of oral health facilities and a lack of awareness due to low literacy. According to World Health Organization, it has been reported that 18% of Pakistans population has some sort of periodontal problems, out of which 31% has periodontitis [11]. This study was designed to assess the pattern of chewable tobacco habits, to assess the oral hygiene habits among patients which causes periodontal diseases.

The use of chewable tobacco as a potential replacement for smoking products remains an area of controversy and public health discussion. The association between patterns of chewable tobacco and oral hygiene practices with periodontal disease is less known. This research examined the effect on periodontal health of the pattern of chewable tobacco with oral hygiene patterns. The results of the study will help in identifying the burden of periodontal disease in the community that will also help in assessing the oral health issues related to chewable tobacco,

which is a shadowed aspect of community towards stake holders so that it can be timely diagnosed and managed.

The objective of the study were to assess the oral hygiene habits among patients visiting dental outpatient department and to determine the pattern of chewable tobacco habits among patients.

2. MATERIALS AND METHODS

It was a comparative cross-sectional study, conducted at the Dental Outpatient Department, Liaquat University Hospital Hyderabad for a period of six months, between1st February 2020 to 31st July 2020. The total Sample size calculated for this study was 362. A non-probability consecutive sampling technique was used. Ethical clearance and approval was obtained from the Research Ethics Committee (No. LUMHS/REC/-823. Dated: 14/11/2019).

Inclusion criteria was patients 18 years- onwards visiting OPD of a tertiary care hospital for dental checkup, both genders male and female, consuming chewable tobacco for more than 1 year and patients who gave consent to participate in the study. The Exclusion criteria was patients who have systemic diseases as confirmed by their previous medical records, as diabetes mellitus, obesity and metabolic syndrome, patients unable to respond to questionnaire, patients consuming smoking tobacco.

This research was carried out on users who met the criteria for inclusion. Every applicants written consent for inclusion in the study was obtained. A pre-designed questionnaire was used to collect the data. Questionnaire forms were close and open ended. The investigator checked the patients, under the supervision of the OPD specialist and classified the periodontal health status.

Firstly, the demographic data was obtained. The second section was related to the history of oral hygiene habits and frequency/practices of consumption of chewing tobacco. Thirdly, all the patient were clinically examined for the periodontal conditions periodontal pocket, bleeding on probing and clinical gingival attachment loss. At the end the status of periodontal disease was diagnosed.

The data was entered, saved and analyzed by using the software SPSS version 21. The frequency and percentage were calculated for categorical variables like gender, marital status, education level, oral hygiene habits and chewing tobacco usage. The mean and standard deviation (SD) were calculated for continuous variables like age and CPITN score. Chi-square test was applied between to check the significant association between variables for oral hygiene habits and chewable tobacco use on periodontal health. Independent sample t-test was applied to compare to means of continuous variables like measure of probing depth and loss of attachment for male and females. The p-value ≤0.05 was considered as statistically significant.

3. RESULTS AND DISCUSSION

A total of 362 subjects were included in the study with the mean age 34.9 and SD ± 11.7.

In terms of periodontal disease diagnosed, 122 (33.7%) had positive while 240 (66.3%) had no history of periodontal disease.

It is explained in Table 1 that an independent samples t-test was performed to compare the measure of probing depth for male and female groups. There was a highly significant difference was found in the scores for males (M=3.32, SD=1.47) and females (M=2.36, SD=1.33) measure of probing depth; t (360) = 4.56, p=<0.001.

An independent samples t-test was also performed to compare the scores of the loss of attachment for male and female groups. Statistically significant difference was found in the scores for males (M=1.4, SD=0.72) and females (M=1.14, SD=0.35) loss of attachment of periodontal ligament; t (360) = 2.61, p=<0.001 (as shown in Table 2).

This table shows in Table 3 that majority of the patients were addicted to betel quid with tobacco 202 (55.8%) followed by gutka 74 (20.4%), mawa 30 (8.3%), snuff 27 (7.5%) zarda 19 (5.2%) and Naswar 7 (1.9%). A highly significant association (P=<0.001) was found between types of chewable tobacco and presence of periodontal disease.

The present study was designed to determine the pattern of chewable tobacco habits, assess the oral hygiene habits among patients visiting dental outpatient department and to determine

the association of oral health maintenance and chewable tobacco with severity of periodontal disease. A total of 362 subjects were recruited in the study out of which 84.5% were males while 15.5% were females with mean age 34.9 and SD ± 11.7.

In the present study, majority of the patients were single (64.4%), mostly were from rural areas (61.6%), were illiterate (24.9%) or only primary education (32%) and around 36.5% were unskilled or unemployed (35.1%). The use of chewing tobacco was more prevalent in low income population (73.8%) living with family (97.2%) and had joined family (61%). Around 33% of the chewing tobacco users were diagnosed with periodontal disease with the measure of probing depth male (M=3.32, SD=1.47); females (M=2.36, SD=1.33) and the loss of attachment of gingiva for male (M=1.4, SD=0.72) and females (M=1.14, SD=0.35). Statistically, significant associations were found between the chewing tobacco and measure of probing depth as well gingival loss of attachment.

A study conducted by Cepeda et al. [12] found that 40% of the subjects had periodontitis overall. In contrast to subjects who flossed more regularly, a higher proportion of subjects who flossed no more than once a week had periodontitis. Unadjusted results show that people who have flossed more than once a week have a lower chance of developing periodontitis relative to those who have not flossed. No dosage response was found, meaning that the protective effect magnitude did not increase with a higher frequency of flossing. The correlation of flossing with periodontitis remains statistically important after modification, but the correlations magnitude has decreased. For someone who flosses more than once a week, the risk of developing periodontitis was 17 percent lower. A dose response was not observed, as with the unadjusted data.

During the analysis of the data of present study we found strong associations between consumption of the different forms of smokeless tobacco (p=<0.001) with diseases of the periodontium. Nicotine, the key alkaloid in tobacco, has a large range of immune system and wound healing effects that can play an important role in the deterioration of periodontal tissue [13]. It is tragic that in developing nations, the practice of consuming tobacco is growing [14]. More alarming is the acquisition of tobacco chewing patterns in various ways. In the research done by Yaragani et al. [15], 82% of current tobacco consumers were found although, 49% reported smoking tobacco, they had tobacco chewing habits. These estimates are in line with details from the Global Adult Tobacco Survey 2016-17 [16,17]. The comparatively lower cost of these items and the less revealing nature of their use compared to smoking are the reasons for increasing the use of smokeless types of tobacco [18].

The findings of the study by Jiang et al. [19] reinforce the adverse effect of intake of tobacco on periodontal status. While there are multiple studies examining the impact of tobacco use on the periodontal health of a person, this is one of the first studies that have attempted to comprehensively document periodontal status by taking different clinical criteria into account. In the present analysis, it was found that current users have a substantially higher percentage of bleeding sites than former users and non-users. Exclusive smokers have had the least occurrence among current users of gingival bleeding.

The finding that current users have a slightly higher number of teeth with periodontal pockets in the current study is inconsistent with the studies performed by Sankaranarayanan et al. [20]. They recorded that about 50 percent (n = 186) of the participants developed deep (almost 4 mm) periodontal pockets in at least one tooth during the follow-up period (Data Set I). The mean (SD) number of teeth with deepened (~ 4 millimeter) periodontal pockets at follow-up was 5,55 among those participants who developed deepened periodontal pockets (4.2). During the follow-up period, about 40 percent (n = 222) of the participants formed deep (about 4 mm) periodontal pockets in at least two non-adjacent teeth (Data Set II). Among those participants who formed deep (about 4 mm) periodontal pockets in at least two non-adjacent teeth, the mean number (SD) of deep periodontal pockets was 6.6. (4.3).

In this analysis, it was found that the number of teeth with attachment loss greater than 5 mm was higher in those participants who reported the use of both forms of tobacco compared with exclusive smokers and chewers. This is contrary to the study conducted by Keles Yucel et al. [21]. who reported Mean PD and CAL values were higher in both full-mouth and sampling sites for periodontitis patients than in patients with gingivitis and healthy controls (P =< .05).

Patients with periodontitis and gingivitis had substantially higher full mouth GI, PI, and BOP scores and sampling sites than healthy subjects (P=0.05) and were comparable in the gingivitis and periodontitis groups (P= >.05). The mean volume of GCF between the groups was substantially different (P= < .05).

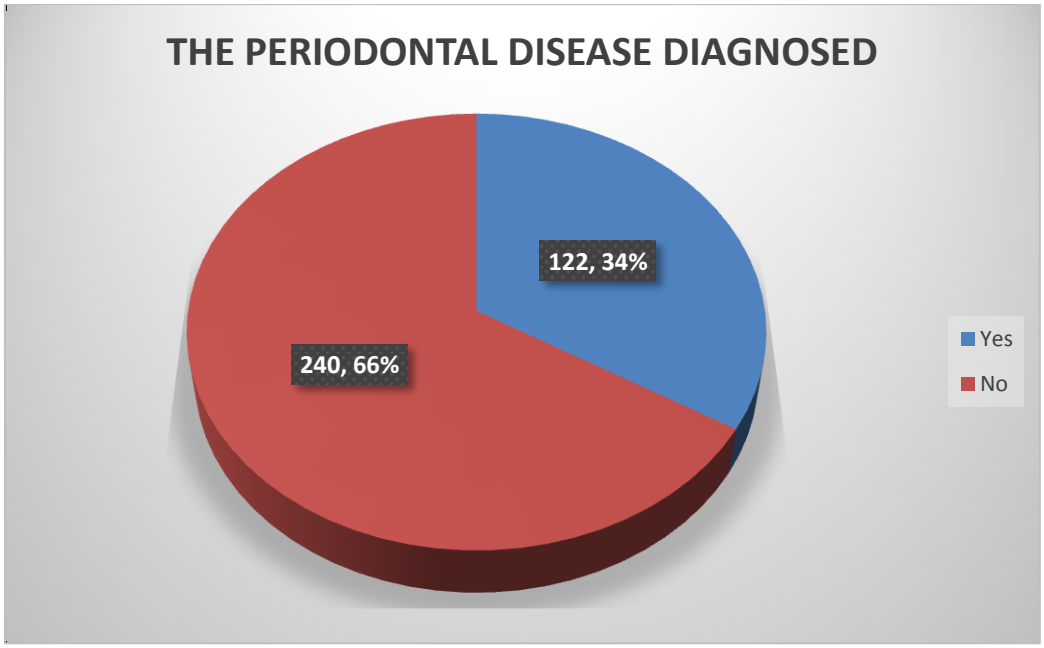

Fig. 1. Distribution of the periodontal disease diagnosed amongst study subjects

Table 1. Measure of the probing depths and loss of attachment of periodontal ligament

Measure the probing depth (in mm)	Gender	Mean	Std. deviation	P value
	Male	3.32	1.47	<0.001
	Female	2.36	1.33	

Table 2. Measure of the probing depths and loss of attachment of periodontal ligament

Loss of attachment (in mm)	Gender	Mean	Std. deviation	P value
	Male	1.4	0.72	<0.001
	Female	1.14	0.35	

Table 3. Type of chewable tobacco products used

Types of Chewable tobacco	Frequency	Percent (%)	P-Value
Betel quid with tobacco	202	55.8	0.001*
Zarda	19	5.2	
Gutka	74	20.4	
Mawa	30	8.3	
Khaini	3	0.8	
Snuf	27	7.5	
Naswar	7	1.9	
Total	362	100	

4. CONCLUSION

It was concluded that the majority of patients who visited the outpatient department had poor oral hygiene due to lack of knowledge and education. The use of different types of chewing tobacco has aggravated the condition by developing pocket formation, bleeding on the probe, and triggering gingival recession. It was also concluded that poor oral hygiene induces periodontal diseases in all users of chewable tobacco. The frequency of non-chewing tobacco users visiting dental OPD was comparably less than chewing tobacco users.

CONSENT

As per international standard or university standard, Participants written consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

Ethical clearance and approval was obtained from the Research Ethics Committee (No. LUMHS/REC/-823. Dated: 14/11/2019).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Sun H, Du M, Tai B, Chang S, Wang Y, Jiang H. Prevalence and associated factors of periodontal conditions among 55- to 74-year-old adults in China: results from the 4th National Oral Health Survey. Clin Oral Investig; 2020.
2. Janakiram C, Dye BA. A public health approach for prevention of periodontal disease. Periodontol 2000. 2020;84(1): 202–14.
3. Xu XY, Li X, Wang J, He XT, Sun HH, Chen FM. Concise Review: Periodontal Tissue Regeneration Using Stem Cells: Strategies and Translational Considerations. Stem Cells Transl Med. 2019;8(4):392–403.
4. Petit C, Anadon-Rosinach V, Rettig L, Schmidt-Mutter C, Tuzin N, Davideau JL, et al. Influence of psychological stress on non-surgical periodontal treatment outcomes in patients with severe chronic periodontitis. J Periodontol; 2020.
5. Sudhakar DU, MM, A MJP, AN. Knowledge, attitude and self-awareness towards Periodontics among non-clinical dental undergraduate students. Int J Appl Dent Sci. 2020;6(3):495–9.
6. Niaz K, Maqbool F, Khan F, Bahadar H, Ismail Hassan F, Abdollahi M. Smokeless tobacco (paan and gutkha) consumption, prevalence, and contribution to oral cancer. Epidemiol Health. 2017;39(1): e2017009.
7. Abdul Hamid G. Tobacco and Betel Quid in Development of Oral Cancer. J Cancer Prev Curr Res. 2017;7(1).
8. Zhang Y, He J, He B, Huang R, Li M. Effect of tobacco on periodontal disease and oral cancer. Tob Induc Dis. 2019;17.
9. Kačírová J, Maďar M, Štrkolcová G, Maďari A, Nemcová R. Dental Biofilm as Etiological Agent of Canine Periodontal Disease. In: Bacterial Biofilms. Intech Open; 2020.
10. Nazir MA. Prevalence of periodontal disease, its association with systemic diseases and prevention. Int J Health Sci (Qassim). 2017;11(2):72–80.
11. Peres MA, Macpherson LMD, Weyant RJ, Daly B, Venturelli R, Mathur MR, et al. Oral diseases: a global public health challenge. The Lancet. Lancet Publishing Group; 2019;394:249–60.
12. Cepeda MS, Weinstein R, Blacketer C, Lynch MC. Association of flossing/inter-dental cleaning and periodontitis in adults. J Clin Periodontol. 2017;44(9):866–71.
13. Zhang Y, He J, He B, Huang R, Li M. Effect of tobacco on periodontal disease and oral cancer. Tob Induc Dis. 2019;17.
14. Sankhla B, Kachhwaha K, Hussain SY, Saxena S, Sireesha SK, Bhargava A. Genotoxic and Carcinogenic Effect of Gutkha: A Fast-growing Smokeless Tobacco. Addict Heal. 2018;10(1):52–63.
15. Yaragani A, Sushuma K, Guduri V, Thirumalasetty SMK, Vishnubhotla G, Kandikatla P, et al. The influence of tobacco consumption on periodontal health: A stratified analysis based on type of tobacco use. J Fam Med Prim Care. 2020;9(4):2061.
16. Mohan P, Lando HA, Panneer S. Assessment of Tobacco Consumption and Control in India. Integr Med Insights. 2018;9.

17. Verma M, Kathirvel S, Das M, Aggarwal R, Goel S. Trends and patterns of second-hand smoke exposure amongst the non-smokers in India-A secondary data analysis from the Global Adult Tobacco Survey (GATS) I & II. Glantz SA, editor. PLoS One. 2020;15(6):e0233861.
18. John RM, Yadav A, Sinha DN. Smokeless tobacco taxation: Lessons from Southeast Asia. Indian J Med Res Suppl. 2018;148: 46–55.
19. Jiang Y, Zhou X, Cheng L, Li M. The Impact of Smoking on Subgingival Microflora: From Periodontal Health to Disease. Front Microbiol. 2020;11.
20. Sankaranarayanan R, Saxlin T, Knuuttila M, Ylöstalo P, Suominen AL. Alcohol use and the development of periodontal pockets: An 11-year follow-up study. J Periodontol; 2020.
21. Keles Yucel ZP, Afacan B, Emingil G, Tervahartiala T, Kose T, Sorsa T. Local and systemic levels of aMMP-8 in gingivitis and stage 3 grade C periodontitis. J Periodontal Res; 2020.

Peer-review history:
The peer review history for this paper can be accessed here:
https://www.sdiarticle4.com/review-history/73595