



PREVALENCE OF PERIODONTITIS IN SMOKERS, SMOKELESS TOBACCO CHEWERS IN CENTRAL INDIA POPULATION

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ABSTRACT

Aim: The present study was aimed to find out prevalence of periodontitis in smokers, smokeless tobacco chewers in Central India population.

Material and Methods: In a cross sectional analytical study 412 volunteers were evaluated. There were 4 groups including smokers (ST), smokeless tobacco consumers (SLT), combined smokers and smokeless tobacco consumers (CS) and persons without any of the above habits, 104 in each group. Periodontitis was assessed by Community Periodontal Index.

Results: In this study, 43% in ST group, 68% in SLT group, 82s% in CS group and 30% in no habit group patients have been diagnosed with periodontitis. The results of SLT and CS groups are higher than other two groups.

Conclusion: The habit of smokeless tobacco i. e. mainly kharra chewing has strong association with periodontitis.

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INTRODUCTION

Periodontitis is an inflammation of tissues surrounding tooth. There are various types of periodontitis, but chronic periodontitis according to 1999 classification is the most prevalent form of periodontitis. It is slowly progressing disease. Chronic periodontitis has been defined as “an infectious disease resulting in inflammation within supporting tissues of the teeth, progressive attachment loss, and bone loss.”(1) This definition includes clinical as well as etiological features of the disease: 1) Microbial plaque formation 2) Periodontal inflammation 3) Loss of attachment 4) Loss of alveolar bone.(1) Periodontitis usually results in pocket formation unless gingival recession contributes to attachment loss. Chronic periodontitis is multifactorial in origin. The etiology for chronic periodontitis includes: 1) Previous history of periodontitis 2) Local factors 3) Systemic factors 4) Environmental and behavioral factors 5) Genetic factors. Smoking and use of tobacco products come under environmental factors for etiology of chronic periodontitis.(1)

In India tobacco was introduced in late 16th and 17th century by the Portuguese traders, and tobacco smoking became a symbol of aristocracy with the introduction of “hookah” during the Moghul rule. In 1776, British East India Company began growing tobacco in India as a cash crop. In the late 19th century, the beedi industry began to grow in India. Recently the consumption of Gutka which is smokeless form of tobacco has overtaken smoking form of tobacco.

In India various forms of tobacco are being used. It mainly includes smoked form and smokeless form. Smoked tobacco includes bidi, chillum, chutta, cigarettes, dhumti, hookah and hookli. Smokeless tobacco includes khaini, Manipuri tobacco, mawa/ kharra, mishri/masheri, paan, snuff, zarda, gutka, pan masala and gudakhu(2).

In central India population kharra chewing is a highly prevalent tobacco consumption habit. Kharra is a preparation containing thin shavings of arecanut with addition of tobacco and slaked lime. Arecoline, a natural alkaloid in areca nut, has genotoxic, carcinogenic, embryotoxic, and immunotoxic potential(3). Nicotine, have effects on the immune system and wound healing, which may also cause periodontal tissue destruction(4). Nicotine exposure has been shown to result in vasoconstriction and impaired angiogenesis(5). Its effects on neutrophil function include increased shedding of adhesion molecules and alteration of f-actin kinetics, resulting in reduced migration of neutrophils into the oral tissues, and inhibition of phagocytosis and oxidative killing(6). Nicotine exposure also results in reduced proliferation and function of T-lymphocytes, decreased phagocytosis and production of pro-inflammatory cytokines and oxygen radicals by monocytes, increased levels of tissue-destructive cytokine such as TNF- α , reduction in levels of antibodies to periodontal pathogens, and impaired attachment of human periodontal ligament fibroblasts(7–9).

In literature there are studies showing effect of smokeless tobacco consumption on causation of oral malignant and

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premalignant lesion, but very few studies about exclusive relationship of smokeless tobacco consumption and periodontitis in Central India population are published. Hence this study was planned.

Aim

To evaluate and compare the prevalence of periodontitis in smokers, smokeless tobacco consumers & combined smoked & smokeless tobacco consumers in central India population.

MATERIAL AND METHODS

This is a cross sectional study conducted in central India population.

Sample size was calculated using Epi info online version sample size calculator using

$$N = \frac{2 (Z\alpha + Z\beta)^2 P}{d^2}$$

Sample size was calculated to be 103 per group.

Ethical clearance was obtained from Institutional Ethics committee. A whole procedure was explained to the participants and those willing to participate voluntarily were included in the study. There were four groups of participants, three test groups and one control group. The test groups were smokers (ST), smokeless tobacco consumers (SLT), combined smokers and smokeless tobacco consumers (CS) and control group was participants without any tobacco consumption habit. Participants above the age of 18 years were included in this study.

A questionnaire was prepared. It includes all the information about demographic data of the patient that is age, sex, address of the participants. It also includes about education, occupation and socioeconomic status of the participants and detailed history about the habit i. e. duration, frequency, amount and type of tobacco consumption. It also includes teeth cleaning habit and intraoral examination. Intraoral examination was done by using mouth mirror and CPI-TN probe. For the diagnosis of periodontitis Community Periodontal Index was taken from each participant. In this manner 103 participants per group and total 412 participants were examined. Thorough history was taken for recording the risk factors for periodontitis.

SURVEY QUESTIONNAIRE

- Date:
- Name of patient:
- Age/sex:
- Address:
- Education:
- Occupation:
- Socio-economic status:Low/Medium/High
- History of Habits:

| Habits | Particulars | Duration of Habit | Frequency per day | Amount/ Numbers |
|---------|--|-------------------|-------------------|-----------------|
| Smoking | Bidi/Ciggarates/Cigar/ Reverse chutta/ Smoking | | | |
| Chewing | Tobacco & Lime/ Betel nut/ Gutka/ Kharra | | | |

- a) Chewing habit: Site of placement:
Length of placement:
- b) Introduced by:Self/Family/Friends
- c)Teath cleaning habit:

- Intra-oral Examination:
 - a)Teeth Present: _____

- Community Periodontal Index:
 - 3. CPI Score:

| | | |
|-------|----|-------|
| 17/16 | 11 | 26/27 |
| 47/46 | 31 | 36/37 |

- 4. CPI- Loss of attachment:

| | | |
|-------|----|-------|
| 17/16 | 11 | 26/27 |
| 47/46 | 31 | 36/37 |

- Result Interpretation:

1. LPI score:

| | | |
|-------|----|-------|
| 17/16 | 11 | 26/27 |
| 47/46 | 31 | 36/37 |

Scoring criteria: -

| Score | Criteria |
|-------|---|
| 0 | Healthy |
| 1 | Bleeding observed, directly or by using a mouth mirror, after probing |
| 2 | Calculus detected during probing, but all the black band on the probe visible |
| 3 | Pocket 4-5 mm(gingival margin within the black band on probe) |
| 4 | Pocket 6 mm or more(black band on the probe not visible) |
| X | Excluded sextant |
| 9 | Not recorded |

2. LPI- Loss of attachment:

| | | |
|-------|----|-------|
| 17/16 | 11 | 26/27 |
| 47/46 | 31 | 36/37 |

Scoring criteria: -

| Score | Criteria |
|-------|---|
| 0 | Loss of attachment 0-3 mm(CEJ not visible and CPI score 0-3) |
| 1 | Loss of attachment 4-5 mm (CEJ within black band) |
| 2 | Loss of attachment 6-8 mm (CEJ between the upper limit of the black band and the 8.5 mm ring) |
| 3 | Loss of attachment 9-11 mm (CEJ between the 8.5 mm and 11.5 mm rings) |
| 4 | Loss of attachment 12 mm or more (CEJ beyond 11.5 mm rings) |
| X | Exclude sextant (Less than two teeth present) |
| 9 | Not recorded (CEJ neither visible nor detected) |

Statistical Analysis

Statistical analysis has been carried out using SPSS 16.0 online version software. Chi square test has been used for intergroup comparison between 4 groups.

RESULTS

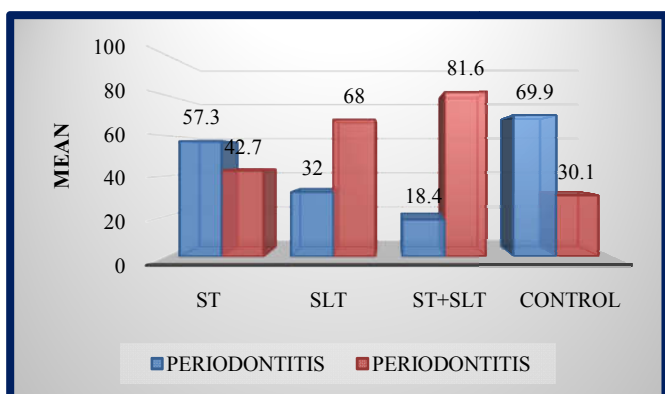
In this cross-sectional study total 412 patients were examined. There were three test groups i. e. group A smokers (ST), group B smokeless tobacco consumers (SLT), group C combined smokers and smokeless tobacco consumers (CS) and group D was control group i. e. participants without any tobacco consumption habit. Detailed history about type, duration, frequency and amount of tobacco consumption was taken. For the diagnosis of periodontitis community periodontal index with attachment loss was taken.

In A group i. e. smokers (ST) out of 103 patients, 44(42.7%) participants were having periodontitis and 59(57.3%) participants were not having periodontitis. In B group i. e. smokeless tobacco consumers (SLT) out of 103 participants,

70(68%) participants were having periodontitis whereas 33(32%) participants were not having periodontitis. In group C i. e. combined smokers and smokeless tobacco consumers(CS) out of 103 participants, 84(81.6%) participants were having periodontitis whereas 19(18.4%) participants were not having periodontitis. In group D i. e. control group out of 103 participants, 31(30.1%) participants were having periodontitis whereas 72(69.9%) participants were not having periodontitis.

From the graphical presentation one can see the maximum number of periodontitis is present in combined smokers and smokeless tobacco consumers followed by smokeless tobacco consumers followed by smokers and control group participants were also having periodontitis but to a lesser extent.

| | | GROUPS | | | | P VALUE |
|---------------|---------|---------------|---------------|---------------|---------------|---------------|
| | | ST | SLT | ST+SLT | CONTROL | |
| PERIODONTITIS | ABSENT | 59 57.3% | 33 32.0% | 19 18.4% | 72 69.9% | <0.001 |
| | PRESENT | 44 42.7% | 70 68.0% | 84 81.6% | 31 30.1% | |
| Total | | 103 100.0% | 103 100.0% | 103 100.0% | 103 100.0% | 412 100.0% |



Graph Prevalence of periodontitis in all four groups

DISCUSSION

This cross-sectional study was designed to find out prevalence of periodontitis in smokers and smokeless tobacco consumers in central India population. According to the results of the study individuals consuming both smoked and smokeless forms of tobacco have more prevalence of periodontitis followed by smokeless tobacco consumers, smokers & individuals without any tobacco consumption habit.

In our study chewers experienced more periodontal destruction of the periodontium than nonchewers which is similar to the findings of studies conducted by Waerhaug(10) and Ling *et al*(3). The possible explanation for this can be absorption of nicotine from SLT products occurs through the oral mucosa and absorption is higher from products, which have a higher pH(11–13). In Central India population kharra is mainly consumed as a SLT product. As kharra is a combination of tobacco, are canut & lime, it results in raised pH and hence more destruction of periodontal tissue.

In our study smokers group shows 44% individuals with periodontitis. Association of smoking and periodontal disease is a proven fact by multiple studies in literature (5). The less prevalence of periodontitis in smokers group can be because

inclusion of all kinds of smokers i. e. heavy smokers, light smokers, etc.

Kharra chewing habit has high prevalence in Central India population in all age groups. Along with periodontitis kharra chewing is also associated with development of premalignant lesions who possibly can transform into cancerous lesions(14,15). Hence proper counselling of the patients should be done to quit habit. Efforts should be made to guide adolescents about ill effects of tobacco containing products.

CONCLUSION

From this study it can be concluded that smokeless form of tobacco has more deleterious effects on periodontium than smoked form of tobacco in Central India population. As kharra chewing is highly prevalent in Central India population, preventive measures needs to be taken.

Limitations

1. Study design: It is a cross sectional study, hence causal association cannot be drawn. A longitudinal case control study should be designed.
2. Parameters assessed: In our study, diagnosis of periodontitis has been made based on CPITN index as it was survey. Clinical parameters like probing pocket depth, clinical attachment loss and gingival recession could have given us detailed information about severity of periodontitis.

Future Perspectives

To substantiate the results of this study future longitudinal studies with long term follow up and utilizing appropriate inclusion criteria as well as clinical parameters to diagnose periodontitis needs to be carried out.

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