

Association of Smoked and Smokeless Tobacco with Tooth Loss

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ABSTRACT

Background: Tooth loss is associated with numerous factors which includes smoking, systemic diseases, age, poor oral hygiene, level of education and socio economic status etc. Association of tobacco and tooth loss is known but relationship of other modes of tobacco i.e. smokeless tobacco (chewable) with tooth loss is in dearth.

Aim: To figure out the relationship of tooth loss with smokeless tobacco along with other variables such as presence of tobacco use (both smoked and smokeless), age and gender.

Methodology: Three hundred and thirty six participants were included in this study. 'Controls' were based on the presence of all teeth and 'Cases' were based on one or more than one tooth missing. Participants were questioned about use of smokeless tobacco (chewable), presence of tobacco use (both smokeless and smoked), age (> than 30 or < less than 30) and gender (male or female).

Results: There was no statistically significance of tooth loss (dependent variable) with any of the independent variables such as smokeless tobacco, age and gender. However presence of tobacco use i.e. both smokeless and smoked has 1 time more chance of tooth loss (OR=1.535) (C.I.=0.54-4.335) as compared to absence of tobacco use.

Practical implication: This study will figure out the association of tooth loss with use of smokeless tobacco because research in this aspect is insufficient. Results of this study would help in determining smokeless tobacco as a reason of tooth loss.

Conclusions: Presence of tobacco use either smokeless or smoked can lead to tooth loss.

Keywords: Tooth loss, Smoked and smokeless tobacco, Gender, Age

INTRODUCTION

Tooth loss is a process in which one or more teeth becomes loose and fall out. Loss of teeth can be due to dental diseases like caries and periodontal diseases. Tooth loss is also associated with non-dental factors like smoking, systemic diseases, age, poor oral hygiene, level of education and socio economic status etc¹. Many clinical studies and surveys have found that smoking is associated with poor oral health status. The use of tobacco, both smoked and smokeless, is increasing rapidly among young adults, but evidence showing relationship between tobacco and tooth loss is limited².

Many studies have concluded that tobacco users and smokers have more missing teeth and experience more tooth loss than non-tobacco users and non-smokers^{3,4}. It has been demonstrated that tobacco smoking can result in an increased loss of periodontal attachment as well as alveolar bone^{5,6}. Smokeless tobacco can be used in various forms, including powder, tobacco leave, plug or twists of dried tobacco. They may be flavored which can be chewed or placed between cheeks and gums. Frequent use of tobacco may lead to tooth loss but studies investigating relation between smoked and smokeless tobacco is rare.

According to previous researches, smoking intensity is related to the incidence of tooth loss and those with more packets per day have higher incidence of tooth loss than the lower ones. There was a significant positive exposure observed in between smoking and tooth loss in men and women^{7,8}.

Research regarding association of tooth loss and use of smokeless tobacco is rare and considering smokeless tobacco as one of the reason of tooth loss is insufficient.

Therefore the purpose of this study is to find out the relationship of outcome i.e. tooth loss with exposure i.e. smokeless tobacco (chewable) along with other variables such as presence of tobacco use (both smoked and smokeless), age and gender.

MATERIALS AND METHODS

This cross sectional study was conducted at dental departments of Dow University of Health Sciences and Sir Syed College of Medical Sciences for Girls during the period of 1st September 2022

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to 30th November 2022 after permission from Ethical Committee. Three hundred and thirty six participants were included in this study. 'Controls' were based on the presence of all teeth and 'cases' were based on one or more than one tooth missing. All the participants were questioned about type of chewable tobacco used, presence of tobacco use (smokeless and smoked), age (> than 30 or < less than 30), gender (male or female). Type of chewable tobacco included pan, gutka, niswar and betel nuts. Odds ratios (ORs) and 95% confidence intervals (CIs) were calculated to find out statistical significant difference.

RESULTS

One hundred and eighteen participants were controls and 14 were cases in which exposure was absent. 27 participants were control and 177 were cases in which exposure was present (Table 1). The use of smokeless (chewable) tobacco had 55 times higher chances of tooth loss than non-users of smokeless (chewable) tobacco. There are 0.7 times higher chances of tooth loss in people more than 30 years of age and males having more than 2 times chance as compared to females. However there was no statistical significance of tooth loss (outcome) with exposure (smokeless tobacco, age and gender). The only statistical significance was found with presence of tobacco use (smoked and smokeless) with tooth loss. Presence of tobacco use (smoked and smokeless) had more than 1 time chance of tooth loss as compared to no tobacco use. Statistically only method of tobacco use was significant because it did not show the value of 1 in their confidence interval (C.I)⁹ (Table 2).

Table 1: Exposure and outcome (n=336)

Smokeless tobacco (exposure)	Tooth loss (outcome)	
	Control	Case
Absent	118 (35.2%)	14 (4.2%)
Present	27 (8%)	177 (52.6%)

Table 2: Odds ratio and 95% confidence interval

Variable	Odds ratio	95% Confidence interval
Smokeless tobacco	55.25	(27.81-109.74)
Age	0.779	(0.498-1.220)
Gender	2.85	(1.82-4.46)
Presence of tobacco use	1.535	(0.54-4.335)

DISCUSSION

Loss of teeth with association to smoked or smokeless tobacco was present in the current study when compared to absence of tobacco use in any form. However it was difficult to find an association of tooth loss in relation to time period of tobacco use. Researches have been done in which association of smoking and tooth loss was observed in young adults⁸⁻¹⁰. Several studies have pointed out that smoked tobacco is a huge risk factor for increased tooth loss¹¹⁻¹⁴ but data in regard to tooth loss with smokeless tobacco is in dearth. A study on Thai population showed that use of betel quid had a strong relationship with tooth loss¹⁵. There has been surveys that has shown that use of smokeless tobacco is more common in Pakistan as compared to smoked tobacco⁶.

Increased age is also related to increased tooth loss which is seen in this study and is also observed as a usual pattern. In one study it was shown that maxillary arch is affected more with smoked tobacco while mandibular arch is affected more because of smokeless tobacco¹⁶. Smoked tobacco produces harmful effects on periodontal tissues and smoked tobacco produces gingival recession and loss of attachment in mandibular teeth.¹⁷ Reason of tooth loss with smokeless tobacco specifically in the mandible could be the site where different types of smokeless tobacco are placed. Usually the users of smokeless tobacco uses lower buccal vestibule as the site to retain the product. A study on South Indian population showed an insignificant statistical analysis of tooth loss with smokeless tobacco¹⁸. In one study periodontal disease was very much higher with tobacco pan chewers when compared to non-tobacco pan chewers¹⁹.

In Pakistan use of smokeless tobacco is increasing day by day and is now considered as a part of routine life. People have a general belief that use of smokeless tobacco is less harmful as compared to smoked tobacco. Some part of the population also has this belief that use of different types of smokeless tobacco can be helpful in relieving pain and bad breath. The way tobacco leaf is processed contains about 3000 chemicals and of which majority are constituents of leaf. Remaining of the ingredients is derived from other sources such as soil, atmosphere and different sort of flavors. Chemicals such as nicotine, carcinogenic nitrosamines, and toxic metals such as lead, mercury, arsenic, cadmium, alkaloids and polycyclic aromatic hydrocarbons have a high potential risk²⁰. Among all these toxic agents' nicotine has been shown to have a harmful effect on gingival and periodontal ligament fibroblasts.²¹

New types of smokeless tobacco like sinus and those which get dissolved in oral cavity are now easily available. Unlike traditional smokeless tobacco they are available in special package system and users don't have to expel the salivary by-products. They can be easily hide from adults and are available in different flavours²². Most common type of smokeless tobacco in U.S is snuff. This type of smokeless tobacco is grounded very fine when processed and can be kept in the oral cavity²³.

Smokeless tobacco is used in an immense quantity in Pakistan and India. According to some survey the quantity has reached upto 100 million. Its use in such a huge quantity is because it is easily available, cheap and its wide production. Misconception regarding the use of smokeless tobacco that it has some medicinal value and it is less harmful has made its utilization on a wide scale²⁴.

In this study other factors like oral hygiene, systemic diseases, socioeconomic status and poor nutrition were not included. These variables could have provided a chance to correlate tooth loss with these factors. This study also did not correlate the tooth loss with different types of smoked tobacco used, which if done, would have given us idea of potential harmful effects of individual type of smokeless tobacco on tooth.

CONCLUSION

It can be concluded from this study that both smoked and smokeless tobacco has an association with tooth loss. However there is a need to correlate tooth loss with other factors such as type of smokeless tobacco, oral hygiene, systemic diseases and socioeconomic status.

Conflict of interest: Nothing to declare

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