



# PREVALENCE OF LICHENOID REACTION IN SMOKELESS TOBACCO USERS REPORTED IN A PRIVATE DENTAL COLLEGE - A RETROSPECTIVE STUDY

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**Abstract:** Oral lichenoid reactions are clinical and histological contemporaries of oral lichen planus, except that the oral lichenoid reactions have an etiological factor. There are several causes for lichenoid reaction like dental restorative material, drugs and medications, tobacco, graft-versus-host disease etc. Tobacco induced oral lichenoid reaction occurs as a unilateral, wavy, non elevated, non scrapable white lesion. The aim of the study to assess the prevalence of oral lichenoid reactions in smokeless tobacco users. The study was conducted as a retrospective - university based study. Datas of patients who were diagnosed with oral lichenoid reactions were collected. The datas were entered in excel sheets and analysed using SPSS software. Chi square test was done to assess the association between gender groups and tobacco habits. The present study shows the prevalence of lichenoid reaction in smokeless tobacco users is significantly high with the p-value ( $p=0.004 < 0.05$ ), with buccal mucosa is the most common clinical side. However, there is no significance in the intensity and duration of chewing habit to lichenoid reaction. The prevalence of lichenoid reaction in smokeless tobacco users is high with buccal mucosa as the most common site.

**Keywords:** chewing tobacco, mucosal changes, oral lichenoid reaction, oral lichen planus. Erythematous, tobacco habit, amalgam induced lichenoid reaction, immune mediated

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## INTRODUCTION

The use of smokeless tobacco causes a series of changes in the oral mucosa that occurs in different permutations and combinations. This ranges from chewers mucosa to potentially malignant disorders to malignancies. [(1)] Oral lichenoid reaction is a chronic inflammatory lesion of the oral mucosa that occurs as an allergic response to dental materials, medications, tobacco etc. [(2)] Oral lichenoid reactions are lesions that mimic oral lichen planus. Oral lichenoid reaction is usually diagnosed with history of any drugs, systemic conditions like hepatitis etc. Clinical examination can reveal amalgam Restoration in the adjacent tooth region, region for placement of smokeless tobacco and histopathological studies. [(3)] Oral lichenoid reaction usually occurs as unilateral lesions, whereas lichen planus occurs as bilateral lesions. Histopathological studies reveal deeper penetration

of the inflammatory cells, perivascular cuffing, presence of plasma cells in addition to other changes seen in lichen planus. [(4)]

Lichenoid reactions associated with drugs, histologically appear as delayed hypersensitivity reactions. Few drugs that produce lichenoid reactions are: NSAIDS: Naproxen, Tolbutamide. Antihypertensive: methyldopa, Propranolol. Antimalarials: ketoconazole, Quinacrine, Etc. [(4)] Lichenoid reaction due to dental restorations: Amalgam and mercury are known to elicit lichenoid reaction. Common anatomical site involved are posterior buccal mucosa, lateral border of the tongue and surface that are in contact with the restoration. [(5)]

Tobacco induced lichenoid reactions: This term has been proposed for an entity found exclusively in betel tobacco chewers. This lesion resembles oral lichen planus and clinically appears as fine, white, wavy, parallel lines do not overlap or criss cross, are non elevated and in some instances radiate from a central erythematous area. Removal of the offending cause results in the resolution of the lesion. [(6)]

Our team has conducted various studies that include in vitro studies, case reports, [(7-10)] reviews, [(11-15)] surveys, [(16)] clinical trials. [(17-21)] Previously our team has a rich experience in working on various research projects across multiple disciplines (22-31). Now the growing trend in this area motivated us to pursue this project.

Now we are focusing on retrospective studies. The aim of this study was to assess the prevalence of lichenoid reactions in smokeless tobacco users.

## MATERIALS AND METHODS

**Study setting:** This is a retrospective university based study. The patients who were diagnosed with lichenoid reactions were involved in the study. Study duration was from June

2019 to March 2020. Ethical approval was obtained from the Institutional Ethical Committee - Saveetha Dental College. (SDC/SIHEC/2020/DIASDATA/0619-0320).

Sampling: Data of patients with lichenoid reaction were retrieved. Case sheets of 23 patients were collected and cross verified by another reviewer to minimise sampling bias.

Data collection and Tabulation: Datas collected were tabulated in Microsoft Excel sheets with columns age, gender, tobacco habit, intensity, duration and diagnosis.

Statistical analysis: The Excel sheet was transferred to the host computer and the process in SPSS v20. Chi-square test was done to analyse the association and age and gender as independent variables and tobacco habit, intensity duration as dependent variables.

## RESULTS AND DISCUSSION

In the present study, the assessment of the prevalence revealed, the prevalence of lichenoid reaction is significantly high in males with pan chewing habit with the p-value ( $p=0.004 < 0.05$ ). (Table 2, Graph 3) 78% of the patients diagnosed with lichenoid reaction were male and 29% the patients with lichenoid, did not have any tobacco habit, in this case the causes could be drug reactions or dental restorations. Among those who had tobacco habit, the frequency of each type of tobacco was assessed and found, Hans was the most commonly used type of tobacco However there was no statistically significant correlation between the intensity and duration of tobacco habit with the lichenoid reaction.(Graph 5)

Oral mucosa is affected by a number of lichenoid lesions, the etiology of which is attributed to infective, inflammatory, dysplastic and immune mediated conditions. Oral lichenoid reactions caused by restorative materials, drugs and graft versus host disease have been reported in the literature from time to time. Studies on tobacco induced lichenoid reactions are limited. [(32,33)]

The age distribution of lichenoid reaction revealed lichenoid reaction was more common in individuals below 40years (graph 1). The association of lichenoid reaction with gender groups showed 78% of the patients were males while the remaining 22% were females. (graph 2) Males are at higher risk due to increased use of tobacco. Prevalence of tobacco induced lichenoid reactions with gender is not studied previously. However lichenoid induced by dental restorative materials were more common in females than males. [(34)]

On assessing the prevalence of lichenoid reaction in individuals with and without smokeless tobacco habit and its association with gender groups, (graph 3, Table 1,2) there was a statistically significant difference in the gender groups in association with gender groups. 60% of the patients with lichenoid reactions have the habit of consuming smokeless tobacco in which all of them were male. 29% of the patients with lichenoid did not have any tobacco habit. In a similar study conducted by Vishal Dang et\_al had similar findings, about 17% of their study population with lichenoid reaction did not have any tobacco habit.

The frequency of chewing tobacco was assessed (graph 4).The type of chewing habit was classified into four categories in our study. Panparag chewers, Hans chewers, Mawa chewers and other tobacco consumers. The frequency of lichenoid reaction for the use of Hans and Panparag were literally high with 39% and 28% respectively, followed by other type of tobacco 22% and Mawa 11%. In a study conducted by Vishal Dang et\_al, the frequency rate was higher in Gutka uses leading to the hypothesis that arecanut and catechu found in gutka, either singly or in combination are critical to the development of lichenoid reaction. [(35)]

There is no statistically significant correlation between the intensity and duration of chewing tobacco to lichenoid reaction. There is no previous literature on the intensity and duration of the tobacco and its effect on lichenoid reaction. Vishal Dang et\_al's article states that the duration and frequency of gutka use did not seem to play a major role in the causation of the lesion.[(35,36)]Our institution is passionate about high quality evidence based research and has excelled in various fields ((37–43). We hope this study adds to this rich legacy.

The most common clinical site in which lichenoid reaction occurs was assessed (graph 5). The buccal mucosa is the most common site with 61%, followed by labial vestibules as the second common site by 17%, tongue in 13% of the participants. Labial mucosa is the least common site with 9% frequency rate. Prashanth Pant et al's study reveals that the oral lichenoid reaction occurs as a result of contact of an irritant with the oral mucosa. Tobacco induced lichenoid reaction of buccal mucosa is the most common site where the returned tobacco is usually placed. [(44,45)]

**Study limitations:** Small sample size does not provide results for an entire population. Since it is a retrospective study, there are possibilities of manual errors during data collection. Diagnosis was not confirmed with histopathological report.

**Future scope:** Studies can be performed with a larger population, confirmation with histopathological report can be done for confirmatory diagnosis of oral lichenoid reactions.

## CONCLUSION

From the present study, we can conclude that the prevalence of lichenoid reaction in smokeless tobacco users is high with buccal mucosa as the most common site. Hans and Panparag are the commonly used chewing tobacco in patients with lichenoid reactions as 39% and 28% respectively. Chi-square association with p value = 0.004 ( $< 0.05$ ) indicates statistically significant association between males with 78% prevalence in study population with 28% of pan chewing habit. However, the intensity and duration of the use of smokeless tobacco does not have a significant influence on the causation of lichenoid reaction.

## AUTHOR CONTRIBUTION

First author: Kalaivani N performed data collection, analysis, interpretation and wrote the manuscript.

Second author : Dr.Uma Maheshwari TN contributed to conception, study design, analysis interpretation and critically revised the manuscript.

Third author : Dr.Mahesh Ramakrishnan contributed to review the manuscript.

All the authors have discussed the results and contributed to the final manuscript.

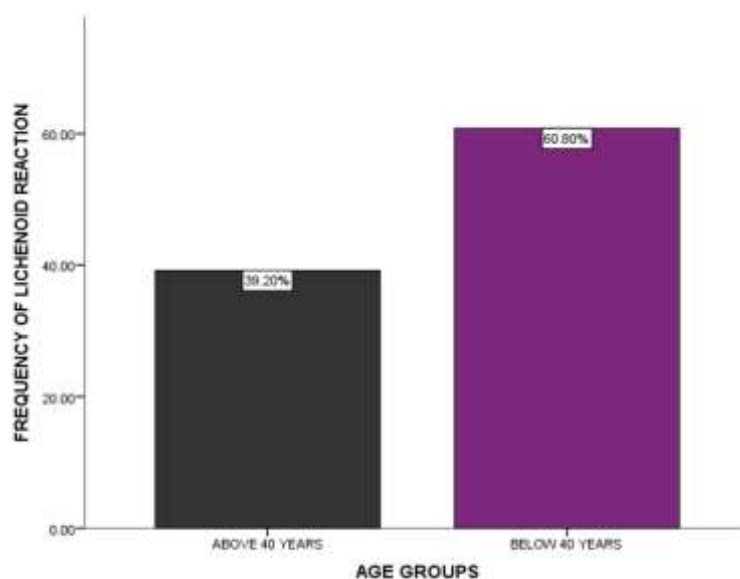
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**Conflict of interest:** None.

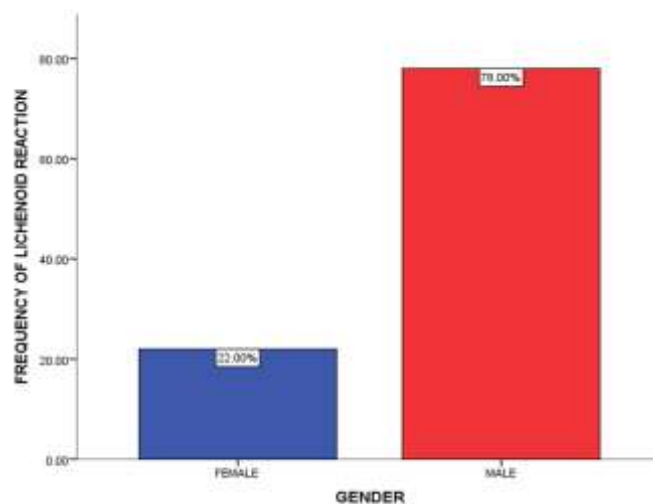
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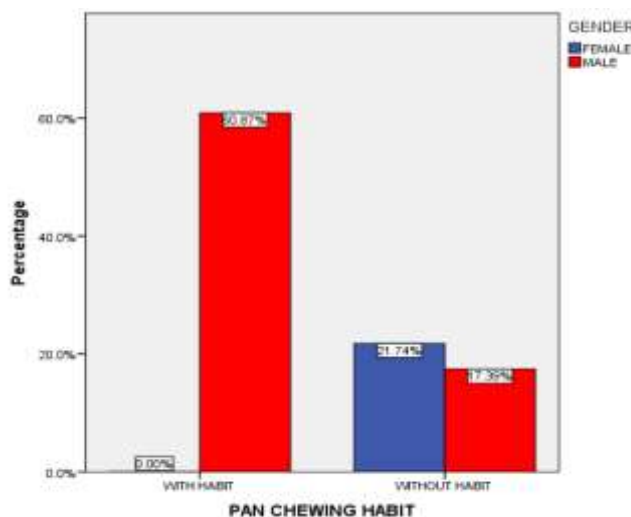
**Graph 1.** Barchart shows the age distribution of patients with oral lichenoid reaction. X axis represents the age groups and Y axis represents the frequency of lichenoid reaction. 60.8% of the patients were below 40 years of age (violet) and 39.2% were above 40 years (Black). Lichenoid reaction was more prevalent in the age group below 40 years.



**Graph 2.** Bar chart reveals the gender distribution in oral lichenoid reaction. X axis represents the gender group (males and female), Y axis represents the frequency of lichenoid reaction.. Lichenoid reaction was more frequent in males with 78% (red) than in females with 22% (blue).

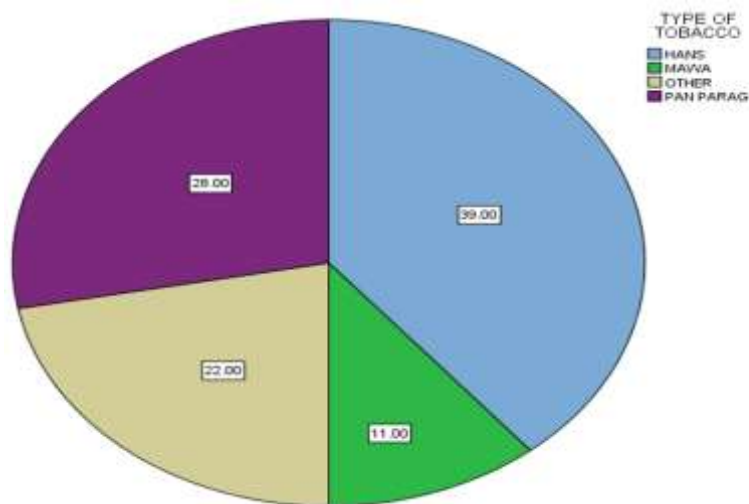
**Table 1.** shows the association of the pan chewing habit with respect to gender distribution. 1 denotes individuals with pan chewing habit and 2 denotes individuals without pan chewing habit. (individuals with pan chewing habit -no. of males -14 and no. of females - 0 ; individuals without pan chewing habit no. of males = 4 and no. of females = 5) \*chi-square test linear by linear association \*\*p = 0.004 (p<0.05) statistically significant association between gender groups and tobacco habit. Hence, the prevalence of lichenoid reaction was higher in males especially in individuals with pan chewing habit

		TOBACCO		Total	df	p value
		1	2			
SEX	MALE	14	4	18	1	0.004
	FEMALE	0	5	5	1	
Total		14	9	23	1	

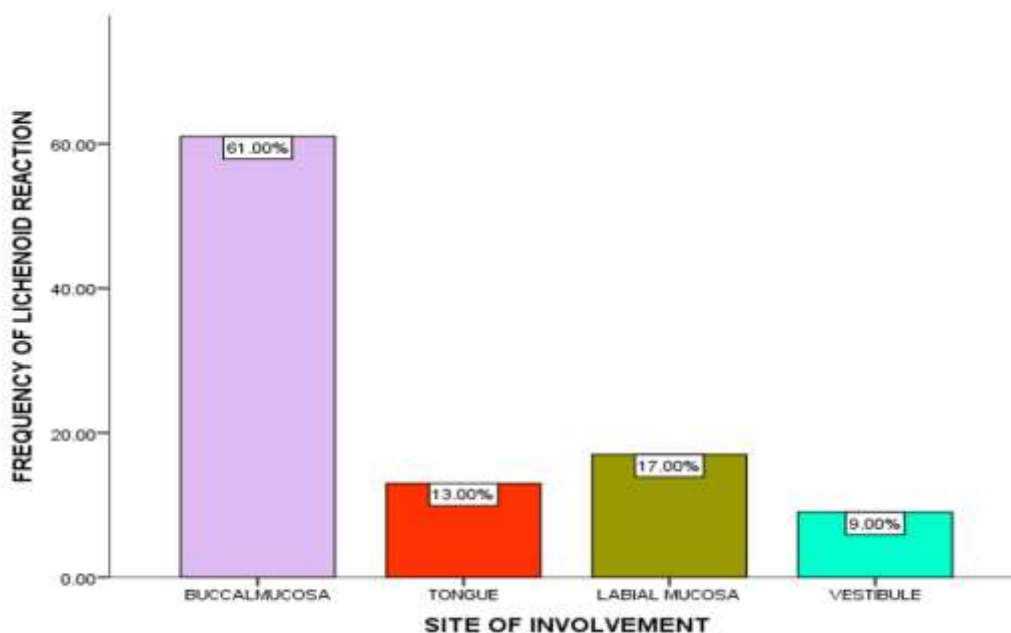


**Graph 3.** Bar graph shows the association between gender groups and pan chewing habits. X axis represents the individuals with and without pan chewing habit and Y axis denotes the frequency of the individuals with lichenoid reaction..\*\*Chi-square test \*p value = 0.004 (< 0.05) indicates statistically significant association between gender groups and pan chewing habit. Hence, the prevalence of lichenoid reaction was higher in males (red) especially in individuals with the pan chewing habit than in females (blue).





**Graph 4.** pie chart shows the frequency of type of chewing tobacco, Hans is the most commonly used type of chewing tobacco in the current study population with the frequency rate of 39% (blue), followed by Panparag with 28% (violet), others 22% (yellow) and mawa 11% (green).



**Graph 5.** Bar chart shows the frequency of the clinical sites in which lichenoid reaction occurs. X axis indicates the clinical sites and Y axis indicates the frequency rate. The buccal mucosa is the most common site at which the lichenoid reaction occurs with 61% (purple), followed by labial mucosa with 17% (red), tongue with 13% (green), vestibule with 9% (blue).