

# Title of the manuscript: Correlation between Oral Health Status and Lesions Associated with Smokeless and Smoking Tobacco in Underprivileged Population.

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## Correlation Between Oral Health Status and Lesions Associated with Smokeless and Smoking Tobacco in Underprivileged Population.

### ABSTRACT :

**Introduction:** Tobacco and smoking has been established as risk factors for the development of potentially malignant and malignant disorders of the oral mucosa. India is the second largest country with tobacco smokers in the world. Aim of this study was to determine the prevalence of habits, habit related oral lesions and association between them among a study population. **Materials and Methods:** A study group comprising of 90 patients with a positive oral habit history was taken. Their demographic details and data regarding number of habits, type of habits and duration of habits was recorded. Three groups were made, Group A with only smoking as a habit, Group B consisting of tobacco chewers only and Group C included participants with history of smoking and tobacco chewing. All the patients were examined clinically for recording the presence of lesions followed by percentage calculations. **Results:** Demographic details of 90 participants were collected, of which equal number of participants lie in all the age groups. Smokers' palate was identified and diagnosed clinically in 6.67% of Group A participants. 20% had a lesion of Tobacco Pouch Keratosis while 3.3% had Leukoplakia as a lesion. 10% of the population from Group 3 had Smoker's palate whereas 13.33% had a lesion of Leukoplakia. **Conclusion:** An association between pre malignant and malignant lesions with tobacco chewing and smoking habit was noticed.

**KEYWORDS:** Habits; leukoplakia; smoking; tobacco.

### INTRODUCTION:

In India, there are currently 267 million tobacco users, making it the second largest country with tobacco users in the world (behind China). Approximately 100 million of the population aged 15 and older currently smoke tobacco in form of cigarettes and bidis. Approximately 200 million of the population aged 15 and older use smokeless tobacco. Tobacco and smoking have been established as risk factors for the development of potentially malignant and malignant disorders of the oral mucosa.<sup>1-8</sup> The concept of certain precancerous lesions leading into oral cancer has been accepted since long.<sup>6,9</sup> Use of the terminology 'Potentially malignant disorders' conveys that all lesions and conditions described under this term may not transform into cancer, instead there are a set of morphological alterations amongst which some may have an increased potential for malignant transformation than others.<sup>10</sup>

'Quid' has been defined as 'a substance or mixture of substances, placed in the mouth or chewed and remain in constant contact with the mucosa usually containing one or both of the two basic ingredients, tobacco and/or areca nut, in raw or any manufactured or processed form.'<sup>11,12</sup> According to an evaluation in 2004 by the International Agency for Research of Cancer both betel quid and areca nut have been considered to be 'carcinogenic to humans.'<sup>11,12</sup> Tobacco in India is most commonly smoked in the form of cigarettes or bidis. A bidi is a crude form of tobacco which is 4-8 cm long and contains 0.25-0.50g of coarse ground tobacco, rolled in a dried piece of temburni leaf in form of cone.<sup>4</sup> Patients with a combination of these habits are frequently found in the Indian population and are considered to be at a higher risk of developing oral lesions due to the added and prolonged exposure to carcinogens.<sup>13</sup> There are various studies which provide critical information regarding the oral habits and the incidence, prevalence, and severity of oral lesions in a specific population.<sup>7,13</sup>

The purpose of this study was to know the prevalence of tobacco chewing and smoking associated lesions only among positive patients with habits and to correlate the relationship of oral habits with potentially malignant oral lesions among this subset of the population.

## MATERIALS AND METHODS :

A study group of 90 patients were chosen with a positive past or present history of oral habits and those which were providing only partial history were excluded from the study. Patients were informed about the details of the study and consent was obtained from all. The input parameters for the sample size calculation used were as follows: 80% power of the study, alpha error 0.05, effect size 0.7, and degree of freedom as 5. The calculated sample size was 64 using G\*power software version 3.1.9.2 (Heinrich Heine university, Dusseldorf), the final considered sample size for the study was around 90. The convenient sampling technique was used in this study. Participants were divided in three groups, Group A, B and C of 30 depending on the habit. A specifically designed Performa was used to record the demographic details and details regarding the oral habit of the patient. Details included type of habit, amount, frequency and duration. The reliability statistics was calculated using Cronbach alpha was 0.631. The questionnaire was prepared using Google forms (Google LLC, Mountain View, California, United States). Data collected were entered in a spreadsheet (Microsoft excel 2016). A thorough clinical examination of the oral cavity was performed by trained professionals to identify the presence of habit associated lesions and were diagnosed based on the knowledge of appearance of the lesions. All the findings and clinical diagnosis were recorded in the Performa.

Leukoplakia was defined as a raised white patch of oral mucosa measuring up to 5mm or more, which could not be scraped off and could not be attributed to any other diagnosable disease. The diagnosis of leukoplakia was a provisional clinical diagnosis with a certainty factor C1. Nicotine Stomatitis also known as Smokers Palate was identified as either a reddened area and a white, speckled, and fissured appearance of oral mucosa. For the identification of Smokeless tobacco keratosis, the patient was asked to locate the area where he/she kept the product. The lesion was then identified as a gray/white mucosal discoloration with a wrinkled or fissured surface texture that is reversible in nature.<sup>10</sup>

## RESULTS :

In Table 1 the demographic details of 90 participants were recorded, of which equal number of participants lie in all the age groups. 66.7% of participants were male whereas 33.3% were female. In table 2 data of Group A participants were recorded. Of the 30 participants, 40% smoked 1-2 cigarettes daily and 26.7% smoked 5-6 cigarettes a day. In Table 3 data of patients in Group B were recorded. 53.3% of the population consumed tobacco 4-5 times a day while 58.9% were consuming for 5-10 years. In Table 4 data of patient of Group C was recorded. Only 3.3% of population smoke 1-2 cigarettes a day while majority smokes 3-4 cigarettes per day (53.3%). Lesions associated with the habits were drafted in pie charts. Smokers' palate was identified and diagnosed clinically in 6.67% of Group A participants. 20% of participants from Group B were diagnosed with Tobacco Pouch Keratosis, while 3.3% had Leukoplakia as a lesion. 10% of the population from Group 3 had Smoker's melanosis whereas 13.33% had a lesion of Leukoplakia.

## DISCUSSION :

Tobacco in India is most commonly smoked in the form of cigarettes or bidis. A bidi is a crude form of tobacco which is 4-8 cm long and contains 0.25-0.50g of coarse ground tobacco, rolled in a dried piece of temburni leaf in form of cone. Patients with a combination of these habits are frequently found in the Indian population and are considered to be at a higher risk of developing oral lesions due to the added and prolonged exposure to carcinogens. Smoking and tobacco chewing was noticed more in female as compared to male. Which is in accordance with other studies. Studies.<sup>1,5</sup> Middle aged individuals were noticed to indulge more in the habit as compared to younger generations.<sup>5,14</sup> Prevalence of oral habits was more among the population with lower education in our study. This trend was noticed in many other previous studies.<sup>15,16,17</sup> In this study population the overall education of 58.9% was till high school level while around 30% of patients were degree or diploma holders which is almost same when compared to a study conducted in 2004 at Chennai.<sup>5</sup> The lack of awareness of the harmful effects of smoking and tobacco chewing is reflected by this low level of education. There is a good percentage of educated population with an increased prevalence of habits which signifies that the worst is yet to come. Based on occupation the largest numbers of patients were employed whereas 11.1% of the population were students. This may be due to the growing trend among the younger generation and peer pressure.

As this study population included only those patients with a positive habit history of smoking and tobacco chewing and not all the routine patients the prevalence of oral lesions is much higher than those recorded by most prevalence studies. The duration and frequency of habits has a significant effect on the development of oral lesions which can be noted in the findings of the present study as well as in another previous study.<sup>6,13</sup> Patients with the habit frequency of more than 5 times a day had the maximum number of lesions. Patients with a combination of habits had more lesions. This might be because the patients with combination of both habits were indulged for more than 10 years. Group B (23.33%) of our study population had premalignant lesions/conditions commonly seen with tobacco chewing habit, with Leukoplakia (3.33%), and OSMF (13.33%) being the most common, was in agreement with the study by Rooban T.et.al<sup>14</sup>, in which OSMF was the most common premalignant condition followed by leukoplakia but was not in accordance with a study by Sarawathi T R.et.al<sup>5</sup>. studies by Marija.et.al

<sup>18</sup> Baric J M.et.al<sup>19</sup>, showed greater prevalence of leukoplakia in subjects who used cigarettes. Tobacco pouch keratosis was noted to be (20%).<sup>20</sup> In Group C among the reactive lesions prevalence of smoker's palate was more (23.33%) than smoker's melanosis (10%) which was seen in the study by Saraswathi T R.et.al.<sup>5</sup> However, Rooban T.et. al<sup>14</sup>, found smoker's melanosis to be the most common reactive lesion, followed by frictional keratosis. The difference could be due to the participants of the studies varying with respect to the type, duration and combination of oral habits.

The trend of premalignant lesions was same as that of Group B, (13.33%) being leukoplakia and 20% being Tobacco pouch keratosis. No cases of OSMF were noted with Group C study population. This study highlights on the fact that as the number of habits increased, number of reactive, premalignant and other lesions increased.

Reactive lesions were highest among the Group A (83.34%), and much more among the chronic smokers; while prevalence of premalignant conditions (36.66%) was highest among tobacco chewers which also increased with chronicity of the habit, while

prevalence of oral lesions both reactive and premalignant were more among both chronic smokers and chronic tobacco chewers. Among the subjects with both habits. In conclusion, the results of the present study explain the correlation between the habits and prevalence of oral lesions. Parameters like education, occupation have been combined with the age and gender of the participants which provides more meaningful information regarding the prevalence of deleterious habits.

The limitations of this study include potential information bias as the patient self-reported and that information was used, hence underreporting of habits could have taken place. Another possible flaw could be detection bias as the examiner was aware of the habit history of the patient prior to oral examination.

#### **RECOMMENDATIONS :**

1. Need for educating patients regarding the adverse effects of tobacco, smoking and betelquid habits through street play and camps can be done
2. More studies need to be performed to establish a relationship between frequency of habits and oral lesions.

#### **CONCLUSION :**

An association between pre malignant and malignant lesions with tobacco chewing and smoking habit was noticed. Duration of indulgence and increased number of oral habits showed increase in mucosal lesions.

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Table 1: Demographic Details (N= 90)

Sr. No	Questions	Responses	Number (N)	Percentage (%)	Total (N)(%)
1.	Age (years)	18-30 years	30	33.3%	90(100%)
		30-50 years	30	33.3%	
		Above 50 years	30	33.3%	
2.	Gender	Male	60	66.7%	90 (100%)
		Female	30	33.3%	
3.	Education Status	Before 12 <sup>th</sup> std	10	11.1%	90(100%)
		Till 12 <sup>th</sup> std	53	58.9%	
		Beyond 12 <sup>th</sup> std	27	30%	
4.	Occupation	Student	10	11.1%	90(100%)
		Employed	83	92.2%	
		Unemployed	6	6.7%	

Table 2: Group A: Habit History of Smoking(N=30)

Sr.No.	Responses	Options	Number(N)	Percentage (N)	Total (N)(%)
1.	Number	1-2	12	40%	30 (100%)
		3-4	10	33.3%	
		5-6	08	26.7%	
2.	Frequency	1-2 times	15	50%	
		3-4 times	11	36.6%	
		4-5 times	2	6.7%	
		More than 5 times	2	6.7%	
3.	Duration	1-5 years	12	40%	
		5-10 years	13	43.3%	
		10-15 years	3	10%	
		More than 15 years	2	6.7%	

**Table No.3 :Group B: Habit History of Tobacco Chewing(N=30)**

1.	Frequency	1-3 times	9	30%	30 (100%)
		4-5 times	16	53.3%	
		More than 5 times	05	16.7%	
2.	Duration	1-5 years	01	3.5%	
		5-10 years	17	58.9%	
		10-15 years	8	30.8%	
		More than 15 years	2	6.8%	

**Table No. 4: Group C: Habit History of Both Smoking and Tobacco Chewing (N=30)**

1.	Number	1-2 Smokes	1	3.3%	30 (100%)
		3-4 Smokes	16	53.3%	
		4- 5 Smokes	13	43.4%	
2.	Frequency	Smoking less than 5 times	23	76.7%	30 (100%)
		Smoking more than 5 times	7	23.3%	
		Tobacco chewing less than 5 times	16	53.3%	30 (100%)
		Tobacco chewing more than 5 times	14	46.7%	
3.	Duration	Smoking less than 10 years	12	40%	30 (100%)
		Smoking more than 10 years	18	60%	
			15	50%	30
		Tobacco chewing less than 10 years	15	50%	(100%)
		Tobacco chewing more than 10 years			

