

PREVALENCE OF ORAL MUCOSAL LESIONS IN DIABETIC AND NON DIABETIC PATIENTS WITH HABITS: A CROSS-SECTIONAL STUDY IN PONDICHERRY POPULATION.

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ABSTRACT:

Aim and Objective: To determine the prevalence of oral mucosal changes in diabetic and non diabetic individuals with tobacco smoking, chewing, and both habits.

Material and methods: The present study included 60 individuals of both sexes under 2 groups. Group 1: diabetic individual with Tobacco usage (smoking, chewing, and both) and Group 2 : Non diabetic individuals with Tobacco usage. Along with the patient's demographic details information regarding the types of habit, duration, frequency, site of placement, period of contact with mucosa.

Result: Of the 60 study population, 30 individuals are diabetic with habits and other 30 are non-diabetic with habits and they are closely matched for age, sex and socioeconomic status with the study sample. There was a considerable difference in the prevalence of oral mucosal changes in the subjects who had diabetes with habits when compared to non-diabetic with habits. This difference was found to be statistically significant. ($P < 0.001$)

Conclusion: In conclusion, we observed the marked presence of the main risk factors (tobacco smoking, chewing and/or both) not only for oral cancer and pre-cancer such as leukoplakia, erythroplakia, oral submucous fibrosis but also other oral lesions such as chowers mucosa, leukoedema, and smokers palate.

Keywords: Oral mucosal lesions, Diabetes, Smoking, Chewing Tobacco.



INTRODUCTION:

The oral mucosa serves as a protective barrier against trauma, pathogens, and carcinogenic agents. It can be affected by a wide variety of lesions and conditions, some of which are harmless, while others may have serious complications (Langlais et al. 2009). Identification and treatment of these pathologies are an important part of total oral health care.^[1]

Tobacco use is one of the most important risk factors for the

development of oral mucosal lesions including oral pre-cancer and cancer. In recent years, various commercial preparations known as pan masala and gutkha have become available in India and in many parts of Asia. Many brands of these products contain areca nut and tobacco, both of which have been implicated in occurrence of oral cancer. The investigators have also observed that smoking and chewing of tobacco and betel quid act synergistically in oral carcinogenesis and that persons with

mixed habits form a substantially high risk population.^[2]

The oral cavity is the first site in the human body, to be exposed to cigarette smoke. The tobacco smoke alters normal homeostasis of the oral cavity, including the saliva's antioxidant and other protective systems. The mucosal changes in smokers may also arise from the drying effects of the mucosa, high intraoral temperatures, intraoral pH changes, local alteration of membrane barriers and immune responses. The use of tobacco is one of the most important risk factors, for the development of mucosal lesions including oral pre-cancer and cancer.^[3]

Diabetes mellitus is a major global health problem, and it has an increasing prevalence due to several factors, such as the population growth, aging, urbanization, and increasing prevalence of obesity or lack of physical exercise. The number of people diagnosed with diabetes is increasing at an alarming rate. Smoking and diabetes alters the immune responses and change in salivary dysfunction leading to a reduction in salivary flow and changes in saliva composition and taste dysfunction.^[4] In addition delayed mucosal wound healing mucosal sensory disorders. Oral health related problems are more with patients who smoke and have diabetes, when compared to those who have smoking habits.^[5] Through this study, we intend to establish the role of diabetes in increasing the possibility of

developing premalignant disorders in tobacco users.

MATERIALS AND METHODS:

The present study included 60 individuals of both sexes under 2 groups. Group 1: Diabetic individual with Tobacco usage (smoking, chewing, and both) and Group 2: Non diabetic individuals with Tobacco usage. The volunteers were selected from the individuals who attended the dental treatment at our institute. We included the individuals with diabetic smoker, chewer and both habits, non-diabetic smoker, chewer and both habits and habits persisting more than 2 years.

We excluded the individuals with history of any systemic diseases other than diabetes mellitus, lactating mothers and pregnant ladies. Informed consent was obtained from all patients prior to the interview and examination. Along with the patient's demographic details, information regarding the types of habit, duration, frequency, site of placement, period of contact with mucosa and history of discontinuation of habit were recorded. Clinical diagnosis of lesion was made and the prevalence of lesion with gender, age and habits were correlated.

The Clinical diagnosis of oral mucosal lesions or conditions such as leukoplakia, erythroplakia, smokers palate, leukoedema and other lesions were based on the pertinent WHO criteria and International seminar on oral leukoplakia and associated lesions related to tobacco habits. The clinical diagnosis of chewers

mucosa, oral submucous fibrosis were based on the criteria provided by Zain et al. The data were analysed using chi-square test and odds ratio (OR) with 95% confidence interval (CI) to estimate the risk of developing an oral lesion in relation to the risk factors.

RESULTS:

Of the 60 study population, 30 individuals are diabetic with habits and other 30 are non-diabetic with habits and they are closely matched for age, sex and socioeconomic status with the study sample. There was a considerable

difference in the prevalence of oral mucosal changes in the subjects who had diabetes with habits when compared to non-diabetic with habits. This difference was found to be statistically significant. (P<0.001)

The estimated odds ratio for developing oral mucosal changes was found to be elevated in the subjects who had diabetic with habits when compared to non-diabetic with habits. The prevalence of oral mucosal lesions was found to increase with the increasing frequency and duration of the habits.

Table:1 Prevalence of habits according to gender:

Habits	Male	Female	Mann-Whitney Test	
			Z value	p Value
Smoking	46	0	6.23*	p < 0.01
	(92.0)	(0.0)		
Tobacco Chewing	8	10	5.25*	p < 0.01
	(16.0)	(100.0)		
Both	4	0	0.92	p > 0.05
	(8.0)	(0.0)		
Alcohol	38	0	4.51*	p < 0.01
	(92.0)	(0.0)		

*p < 0.01 – Significant at 1% level: p > 0.05 – Not significant

As seen from the study findings [Table 1], the difference in the pattern of habits in the two sexes were found to be statistically significant (P< 0.001).

Table:2 Prevalence of Oral Mucosal Lesions in the study group with habit of Diabetic Group:

Mucosal Lesions	Male	Female	Row Totals	Chi-Square	
				Value	p Value
Nil	4	1	5	25.83*	p < 0.01
	(17.4)	(14.3)	(16.7)		
Chewer mucositis	0	1	1		
	(0.0)	(14.3)	(3.3)		
Leukoedema	2	0	2		
	(8.7)	(0.0)	(6.7)		

Oral leukoplakia	5	0	2		
	(21.7)	(0.0)	(6.7)		
Oral erythroplakia	2	0	5		
	(8.7)	(0.0)	(16.7)		
OSMF	0	5	5		
	(0.0)	(71.4)	(16.7)		
Smoker palate	10	0	10		
	(43.5)	(0.0)	(33.3)		
Total	23	7	30		
	(76.7)	(23.4)	(100.0)		

*p < 0.01- Significant at 1% level

In the present study, out of 30 subjects with smoking and chewing habits, 25 (89.3%) showed oral mucosal changes. Out of these, oral submucous fibrosis was found in 5 (62.5%), leukoplakia in 5 (22.7%), erythroplakia in 2 (9.1%). Of these 13 showed other lesions (1 chewers mucosa, 2 leukoedema and 10 smokers palate) [Table 2]

The prevalence of oral mucosal changes in males was 76.7% and females 23.3% and was thus considerably higher in males with these habits. The difference was found to be statistically significant (P<0.001)

Table:3 Prevalence of Oral Mucosal Lesions in the control group with habit of Non-Diabetic Group:

Mucosal Lesions	Male	Female	Row Totals	Chi-Square	
				Value	p Value
Nil	17	1	18	8.40 ^{NS}	p > 0.05
	(63.0)	(33.3)	(60.0)		
Chewer mucositis	1	1	2		
	(3.7)	(33.3)	(6.7)		
Leukoedema	1	0	1		
	(3.7)	(0.0)	(3.3)		
Oral leukoplakia	2	0	2		
	(7.4)	(0.0)	(6.7)		
Oral erythroplakia	0	0	0		
	(0.0)	(0.0)	(0.0)		
OSMF	1	1	2		
	(3.7)	(33.3)	(6.7)		
Smoker palate	5	0	5		
	(18.5)	(0.0)	(16.7)		
Total	27	3	30		
	(90.0)	(10.0)	(100.0)		

The values in the control group are not significant.

Out of 30 subjects with habits of non-diabetic group, 12 (40.0%) subjects had not showed any oral mucosal changes. Of these, 11 (36.7%) showed other lesions (2 chewers mucosa, 1 leukoedema and 5 smokers palate) Oral submucous fibrosis was seen in 2 (6.7%) and leukoplakia in 2 (6.7%) [Table 3] The values in the control group are not significant.

DISCUSSION:

The World Health Organization (WHO) has considered diabetes mellitus a public health problem since 1975. Therefore, it is necessary that health care professionals become interested on the disease in order to provide an appropriate treatment to these patients in the different fields of knowledge.^[9]

India has the highest burden of diabetes mellitus worldwide with an estimated 65.1 million people suffering from diabetes mellitus which is expected to rise to 109 million by the year 2035. The burden of diabetes has increased significantly over the last few decades.^[6] Ghorpade AG et al. (2013) conducted a population-based study of the incidence and risk factor of diabetes in rural Pondicherry and estimated that each year 8.7 million people develop diabetes mellitus. Increasing age, obesity, alcohol use and a family history of diabetes mellitus independently predicted the development of diabetes.^[7]

In this study the prevalence of oral mucosal changes in diabetic and non-diabetic individuals with tobacco

smoking, chewing and both habits were determined in a cohort which has not yet been done before. Smoking and betel quid can affect cell-mediated immunity. In diabetic patients, T-cell function as well as the cellular immune response is impaired. Thus diminished immunity in diabetic patients may facilitate the action of carcinogens.^[8,9]

In addition, there can be microangiopathy in the gingival tissues causing tissue hypoxia and a reduced blood supply, which together with the impaired cellular immune response may play a role in the development of premalignant lesions.^[10] The overall prevalence of leukoplakia (26.9%) in the present study was higher compared to many epidemiological studies and can be explained by the difference in the study population and the tobacco habits of Indian and Western populations.

As in many other studies, our study also supports an association between smoking habits and leukoplakia. The prevalence of erythroplakia was 9.1% in the present study, which is relatively higher compared to the 0.47% prevalence by Lay et al and 1.95% prevalence reported by Chung et al . Chewer's mucosa was found in 3 (10.0%) of the subjects with the habits is relatively higher in comparison to the studies by Axel et al (1.7%) but lower than 13.1% reported by Reichart et al.^[2]

In 2011 Gonul et al. studied oral mucosal lesion in smokers and alcoholic patients and concluded that coated tongue was

common among smokers and alcoholic patients.^[2,10] The results of research by Sujatha et al. in 2012 showed that oral leukoplakia was the most common oral mucosal lesions among smokers. Saintrain et al. in 2012 concluded that oral mucosal lesions are more common in smokers.^[11,12]

Tobacco smoking has many deleterious effects on the oral mucosa and is one of the most important risk factors for oral cancer.^[12] One third of women and two third of men in India use tobacco in one form or another. In prevalence studies of eight rural areas of India, chewing tobacco use was found in 3–53% of men and 3–49% of women. In a study from Mumbai, 69.3% of men used tobacco, 45.7% in smokeless form, similarly in Trivandrum, among the lower socioeconomic group, chewing betel quid with tobacco was practiced by 26.8% of men and 26.4% of women. Betel quid or pan is a mixture of areca nut and slaked lime, to which tobacco can be added, all wrapped in a betel leaf. The specific components of this product vary between communities and individuals.^[11] In our study, The prevalence of oral mucosal changes in

males was 76.7% and females 23.3% and was thus considerably higher in males with these habits. The difference was found to be statistically significant ($P < 0.001$).

Similar to the previous studies, our study demonstrated increased consumption of alcohol among diabetic men, an increase in the incidence of oral mucosal changes among alcohol drinkers with some additional habits (smoking / chewing) as compared to those who are drinking alcohol with these habits.

CONCLUSION:

In conclusion, we observed the marked presence of the main risk factors (tobacco smoking, chewing and both) not only for oral cancer and pre-cancer such as leukoplakia, erythroplakia, oral submucous fibrosis but also other oral lesions such as chowers mucosa, leukoedema, and smokers palate. On the aggregate, the available data suggests that the risk of oral mucosal lesions in diabetic smoking patients is quite higher when compared to non diabetic smokers.

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