

SHORT ARTICLE

A study of oral pre-malignant lesions and related risk factorsSaurabh Varshney¹, Shivanjali Sandhir², Sarita Mishra³¹All India Institute of Medical Sciences, Rishikesh, ²Himalayan Institute of Medical Sciences, Dehradun

Abstract	Introduction	Methodology	Results	Conclusion	References	Citation	Tables / Figures
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Introduction: The occurrence of oral pre-malignant lesions is related to social behavior and addictive habits of the individual. The type of lesions differs from one geographic area to other. There is paucity of data on oral pre-malignant lesion occurring in the state of Uttarakhand. Though not all oral carcinomas are preceded by premalignant lesions as clinically visible morphological alterations occur secondary to the cellular or molecular changes. Their management remains controversially polarized between surgical excision to prevent malignant change and conservative medical or surveillance techniques. **Material and Methods:** It was an observational cross sectional study for one year. 77 cases of oral pre-malignant lesions attending E.N.T. OPD were studied. The lesions included were leukoplakia, oral submucous fibrosis and erythroplakia. **Result:** The males were affected more than females. The male: female ratio was 4.13:1. The most affected age group was 31-40 years (36.36%). The leukoplakia cases were 45 (58.45%), oral submucous fibrosis 26 cases (33.76%) and erythroplakia- 6 cases (7.79%). The habit of tobacco use was found to be a risk factor for development of these conditions. **Conclusion:** The leukoplakia is more common than oral submucous fibrosis. There is correlation between tobacco use and premalignant conditions. The occurrence of oral submucous fibrosis is related to chewable tobacco or other chewable products. The leukoplakia is associated with smoking and its association with alcohol misuse needs further studies

Key Words

Premalignant lesions; oral lesions; tobacco use; risk factors

Introduction

A premalignant lesion is a disease, syndrome, or finding that, if left untreated, may lead to cancer. The term was coined in 1875 by Romanian physician Victor Babeş. Oral premalignant lesions (OPMLs) are relatively common, occurring in about 2.5% of the general population and are an important target for cancer prevention.(15) Oral cancer is a worldwide problem of high magnitude. The concept of a two-step process of cancer development in oral mucosa is well established. It means that there is an initial presence of a precursor (pre-malignant) lesion which subsequently develops into cancer. Oral leukoplakia is the best-known precursor lesion. It is not known

how many oral squamous cell carcinomas arise from precursor lesions and how many develop from apparently normal oral mucosa. However, studies have shown that between 16 and 62% of oral carcinomas are associated with leukoplakic lesions when diagnosed (1). Leukoplakia, oral submucous fibrosis and erythroplakia are well recognized pre-malignant conditions. They can be detected visually, are easily amenable for screening and diagnosis and there is enough evidence to indicate that the cascade of premalignancy is triggered by tobacco (smoking, smokeless or inhaled, tobacco substitutes like pan masala or betel nut quid) and thus is considered as the strongest risk factor for majority of the oral

lesions, followed by alcohol ingestion, poor oral, and dental hygiene (15).

Leukoplakia has been defined by WHO in 1996 as a clinical diagnosis to indicate a white lesion that cannot be removed by gentle scraping and cannot be diagnosed clinically as any other lesion (1). Erythroplakia is an uncommon but severe premalignant lesion. WHO defined erythroplakia as any lesion of oral mucosa that presents as bright red velvety plaques which cannot be characterized clinically or pathologically as any other recognizable lesion. It has a high malignant potential and when the biopsies of erythroplakic patches were studied, 91% were dysplasia or carcinoma in situ or frank carcinomas (14). Oral submucous fibrosis is a disease due to chronic insidious changes in fibroelasticity of oral mucous membrane which is characterized by the burning sensation in the oral cavity, blanching and stiffening of the oral mucosa and oropharynx which leads to trismus. There is a predisposition in the Indian subcontinent for the disease with areca nut chewing as a major implicating factor. The occurrence of pre-malignant diseases is related to various irritants to which the oral cavity is exposed. The causative substances mainly include tobacco smoking, tobacco chewing, pan and other substances of abuse. The nature of various addictive substances which are used by a particular population is related to geographic area, availability of the product, economic status and education of the individuals. There is a need to have the data base of occurrence of such conditions in a particular area. It helps in planning to manage the problems of the oral cancer and pre-malignant conditions. Moreover, on the basis of available data, health care measures can be taken to prevent these conditions which are related to intake of oral substances of abuse intake.

Aims & Objectives

To study oral pre-malignant lesions attending E.N.T. OPD.

Material and Methods

It was an observational cross sectional study for one year. The patients attending the Otolaryngology department with oral pre-malignant conditions were included in the study. The consent of the patient for inclusion in the study was obtained. The ethic committee had cleared the study on oral lesions. Any patient with malignant lesion was excluded from the study.

Results

There were 77 cases of pre-malignant oral lesions. The leukoplakia cases were 45 (58.45%), oral submucous fibrosis 26 cases (33.76%) and erythroplakia- 6 cases (7.79%).

The males predominated the study group with more members in each of the conditions ([Table 1](#)). The maximum number of males had leukoplakia as the pre malignant condition (77.8%) followed by oral submucous fibrosis (80.8%). The females also had leukoplakia as the commonest lesion (22.2%) followed by oral submucous fibrosis. Most of the patients belonged to the age group of 31-40 years (28 patients, 36.36%), followed by 41-50 years of age group (22 cases, 28.58%) and the least number of patients were at the extremes of age i.e. <10 years and >70 years ([Table 2](#)).

The most common site of the premalignant lesions was the buccal mucosa (93.5%), followed by tongue (3.9%) and lip (2.6%). Oral submucosal fibrosis is a generalized involvement of the mucosa of the oral cavity, but as the initial sub-site of involvement is the buccal mucosa, it has been grouped with buccal mucosa lesions ([Table 3](#)).

The total number of patients who smoked tobacco was 46 (59.74%) and the most common lesion in smokers was leukoplakia (34 cases, 44.15%). Non-smokers had the most common lesion as oral submucosal fibrosis with 18 cases (23.37%) ([Table 4](#)). Pan chewing habit was present in 21 cases (27.27%) and these patients had oral submucosa fibrosis as the most common pre malignant lesion (14 cases, 66.67%) ([Table 5](#)). Alcohol abusers formed only 16 cases (20.77%) and had leukoplakia as the predominant premalignant lesion ([Table 6](#)). The other abused substances were pan masala chewing, found in 52 patients (67.53%) and leukoplakia was the predominant lesion (27 cases, 51.92%) in these cases.

Discussion

Out of 77 cases there were 62 males and 15 females. (Male:Female ratio was 4.1:1) ([Table 1](#)). It is at variance with other studies in which females were more affected than males (2, 3). The leukoplakia was more common in males while oral submucous fibrosis was more common in females (4). In a study from Karnataka conducted by Angadi PV and Rekha KP, the ratio between males and females was found to be 11:1(9). The study conducted by Mehrotra R, Pandya S, Chaudhary AK *et al* at Allahabad also had

more male cases (73.2%) than females (26.7%) (6). In the present study male preponderance was noted for both types of lesions. This may be due to the reason that the males constituted a bigger subset of the group studied.

There are 28 cases (36.36%) in the 4th decade followed by 22 cases (28.57%) in the 5th decade ([Table 2](#)). This is in accordance with the other studies (5, 6). In the Karnataka study, the commonest age range group was 21-30 years and females were being affected at a later age (9).

Leukoplakia is a condition which is prevalent worldwide. It has been reported to be 18.2% of all the mucosal lesions in a USA study (7). The Vidisha study reported its prevalence as 40% of oral lesions (8). The occurrence of leukoplakia was higher compared to other lesions when only alcoholic beverages were consumed but was not significant on predictor variables. The odds of having leukoplakia were more with smoking (4).

The study by Mehrotra R, Pandya S *et al* had included 78 cases of leukoplakia, 68 cases of submucous fibrosis and 76 cases of squamous papilloma (5). Leukoplakia was present in 43 cases on buccal mucosa and in 2 cases on lip ([Table 3](#)). The involvement of buccal mucosa as the commonest site in the present study is similar to other studies (5, 6).

The oral submucous fibrosis is restricted to this subcontinent only. It is related to the habit of chewing tobacco in one form or the other. The oral submucous fibrosis was found in 26 cases (33.77%) of premalignant conditions. In the submucous fibrosis group, the affected males were 21 (80.76%) and females 5 (19.23%) ([Table no.1](#)). The buccal mucosa is the site which is commonly involved (9).

Erythroplakia is a premalignant condition with a potentially higher rate of transformation into carcinoma. The present study observed 6 cases (7.79%). The finding is similar to study conducted at Denmark by Holmstrup P, Vedtofte P *et al* which had 5% cases of erythroplakia (10). Alcohol drinking has been indicated as a strong risk factor for erythroplakia (11). In the present study among 6 patients, 50% were alcohol abusers. The number of cases however is small for any attributable significance and this finding needs further investigation.

In the present study it was found that use of tobacco products was quite prevalent. The mode of use, however, was different for different groups. The

habit of smoking tobacco was present in 34 cases (75.6%) of leukoplakia ([Table no. 4](#)). This is similar to the study by Saraswathi TR, Ranganathan K *et al* conducted at Chennai (4). The habit of tobacco chewing and products like pan masala (22 cases; 84.6%) ([Table 7](#)) and pan chewing (14 cases; 53.8%) ([Table no.5](#)) was more common in Oral submucous fibrosis group. The alcohol alone abuse was not found to be common in any of the lesions ([Table 6](#)). A strong correlation has been found in studies between submucous fibrosis and tobacco use (5, 2, 9) as was the finding in the present study.

The Allahabad study by Mehrotra R, Pandya S *et al* (6) had more cases of oral submucous fibrosis compared to leukoplakia while in the present study leukoplakia is more common than submucous fibrosis. It raises the point whether the additives which form the quid are different in the various areas leading to cultural differences.

The practice of betel quid chewing is socially accepted in some parts of the subcontinent. The betel quid is a mixture of areca nut, catechu and slaked lime wrapped in betel leaf. Tobacco may be added to it. The habit of pan chewing has been found to be statistically significant for the development of precancerous oral lesions (3). The availability of commercial products like pan masala and gutka, which are easy to carry, is compounding the problem. The evidences support carcinogenicity and genotoxicity of these products (12). The buccal mucosa is commonly affected as quid is usually kept there for a long time. It has non keratinized epithelium which gets dried. The cessation of tobacco use has led to fall in the incidence of leukoplakia and other lesions (13, 14).

Conclusion

The leukoplakia is more common than oral submucous fibrosis. There is correlation between tobacco use and premalignant conditions. The occurrence of oral submucous fibrosis is related to chewable tobacco or other chewable products. The leukoplakia is associated with smoking and its association with alcohol misuse needs further studies.

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Tables

TABLE 1 DISTRIBUTION OF PATIENTS ACCORDING TO SEX

Diagnosis	Males	Females	Total
OSMF	21(80.8%)	5(19.2%)	26(33.8%)
Erythroplakia	6(100.0)	0(0.0)	6(7.8%)
Leukoplakia	35(77.8%)	10(22.2%)	45(58.4%)
Total	62	15	77

TABLE 2 DISTRIBUTION OF CASES ACCORDING TO AGE

Diagnosis	OSMF	Erthroplakia	Leukoplakia	Total	%
0-10	0	0	0	0	0
11-20	0	1	0	1	1.3%
21-30	7	2	7	16	20.78%
31-40	10	1	17	28	36.36%
41-50	7	1	14	22	28.58%
51-60	2	1	6	9	11.68%
61-70	0	0	1	1	1.3%
>70	0	0	0	0	0
Total	26(33.76%)	6 (7.79%)	45(58.45%)	77	

TABLE 3 DISTRIBUTION OF CASES ACCORDING TO ORAL CAVITY SITE

	Buccal mucosa	Tongue	Lip	Total
Leukoplakia	43	0	2	45 (58.45%)
OSMF	26	0	0	26 (33.76%)
Erythroplakia	3	3	0	6 (7.79%)
	72 (93.5%)	3 (3.9%)	2 (2.6%)	

Note:--The OSMF involved more sites but as it started in buccal mucosa, it has been considered as the site of involvement

TABLE 4 DISTRIBUTION OF CASES ACCORDING TO SMOKING HABIT

Diagnosis	Smoking Yes	Smoking No	Total
OSMF	8(30.8%)	18(69.2%)	26(33.76%)
Erythroplakia	4(66.7.0)	2(33.3)	6(7.9%)
Leukoplakia	34(75.6%)	11(24.4%)	45(58.45%)
Total	46	31	77

TABLE 5 DISTRIBUTION OF CASES ACCORDING TO PAN TAKING HABIT

Diagnosis	Yes	No	Total
OSMF	14(53.8%)	12(46.2%)	26(33.8%)
Erythroplakia	1(16.7)	5(83.3)	6(7.8%)
Leukoplakia	6(77.8%)	39(86.7%)	45(58.4%)
Total	21	56	77

TABLE 6 DISTRIBUTION OF CASES ACCORDING TO ALCOHOL (ALONE) USE HABIT

Diagnosis	(Yes)	(No)	(Total)
OSMF	5 (19.2%)	21 (80.8%)	26(33.8%)
Erythroplakia	3 (50.0)	3 (50.0)	6(7.8%)
Leukoplakia	8 (17.8%)	37 (82.2%)	45(58.4%)
Total	16	61	77

TABLE 7 DISTRIBUTION OF CASES ACCORDING TO TOBACCO/OTHER PRODUCTS CHEWING HABIT

Diagnosis	(Yes)	(No)	(Total)
OSMF	22(84.6%)	4(15.4%)	26(33.8%)
Erythroplakia	3(50.0)	3(50.0)	6(7.8%)
Leukplakia	27(60.0%)	18(40.0%)	45(58.4%)
Total	52	25	77

Figures

FIGURE 1 RIGHT BUCCAL MUCOSA LESION-LEUKOPLAKIA**FIGURE 2 BUCCAL MUCOSA LESION-ORAL SUBMUCOSAL FIBROSIS****FIGURE 3 RIGHT BUCCAL MUCOSA LESION-ERYTHROPLAKIA**