Original Research Article

A 10-Year Retrospective Analysis of Oral Leukoplakia- An Institutional Study

ABSTRACT

Oral Leukoplakia (OL) is a potentially malignant disorder, which is widespread amongst Indian population due to use of smokeless tobacco. It is a diagnosis of exclusion from other oral white lesions.

Objectives: To analyze the cases of Oral Leukoplakia in relation to demographic details and clinicopathologic features.

Materials and Method: Records of OL of last 10 years from departmental archives were retrieved. 213 cases were assessed and analyzed to determine the distribution according to age, gender, anatomical sites, tissue abuse habits and histopathological grading. Descriptive statistics were applied.

Results: Out of 213 patients, there was a male predilection (87.7%) with mean age of occurrence being 4-5th decade (29.5%). The most common site of occurrence was buccal mucosa (49%). Among all these, 3.2% of cases showed malignant transformation.

Conclusion: Among 213 patients assessed, malignant transformation rate of 3.2% was observed in our study. To prevent progress of oral cancer, early detection is important because survival is influenced by the extent of disease at the time of diagnosis.

Keywords: Leukoplakia, malignant, prevalence

INTRODUCTION

Among oral potentially malignant disorders, oral leukoplakia (OL) is the most commonly encountered entity in clinical practice with 2% prevalence worldwide.[1] In 1978, World Health Organization (WHO) group defined OL as: "a white patch or plaque that cannot be characterized clinically or pathologically as any other disease".[2] It is therefore a diagnosis of exclusion from other oral white lesions such as leukokeratosis, infective lesions (candidiasis, syphilitic oral lesion, oral hairy leukoplakia caused by Epstein Barr virus), lichen planus, lupus erythematosus, dyskeratosis congenita, white sponge nevus, submucosal fibrosis and frank carcinomas.[3]

While its clinical presentation is well characterised, there are no pathognomonic microscopic features in a biopsy to arrive at a pathological diagnosis.[4] However, a biopsy is mandatory to rule out other mucosal conditions masquerading OL and to assess their risk status. OL cases are quite high in Indian population because consumption of tobacco in smoking and non-smoking form is relatively high among Indian subcontinent.[6]

OL is a precancerous lesion of the oral cavity with a frequency of malignant transformation from 3.73 to 17%. Oral cancer is one of the leading causes of cancer mortality worldwide, and early diagnosis of high risk, potentially malignant lesions are the higher priorities for the reduction of morbidity as well as mortality. The fact that oral cancer could occur from OL, which is clinically easily accessible, early detection of high-risk lesions, and to conduct chemoprevention trials for arresting or removing the lesions is mandatory. Early detection of a malignancy, especially in the pre-malignant stage, can significantly decrease the mortality and morbidity.[7]

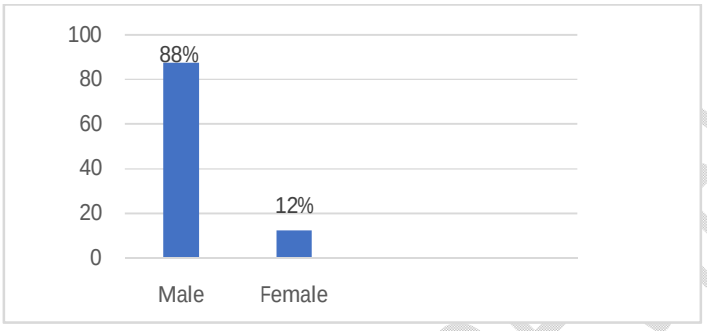
MATERIALS AND METHOD

A retrospective study was performed based on analysis of clinical records of 213 patients diagnosed with OL. On the basis of clinical records of past 10 years, for each patient, age, gender, tissue abuse habits (tobacco, smoking as well as chewing, guthkha, arecanut) , lesion site at the moment of diagnosis and histopathological data were recorded. According to histopathologic findings, lesions were classified into various degrees of dysplasia. Tables were prepared listing age, sex, site, habits and histopathologic findings of 213 OL patients. Descriptive analysis was applied and the results were formulated.[8]

RESULT AND DISCUSSION

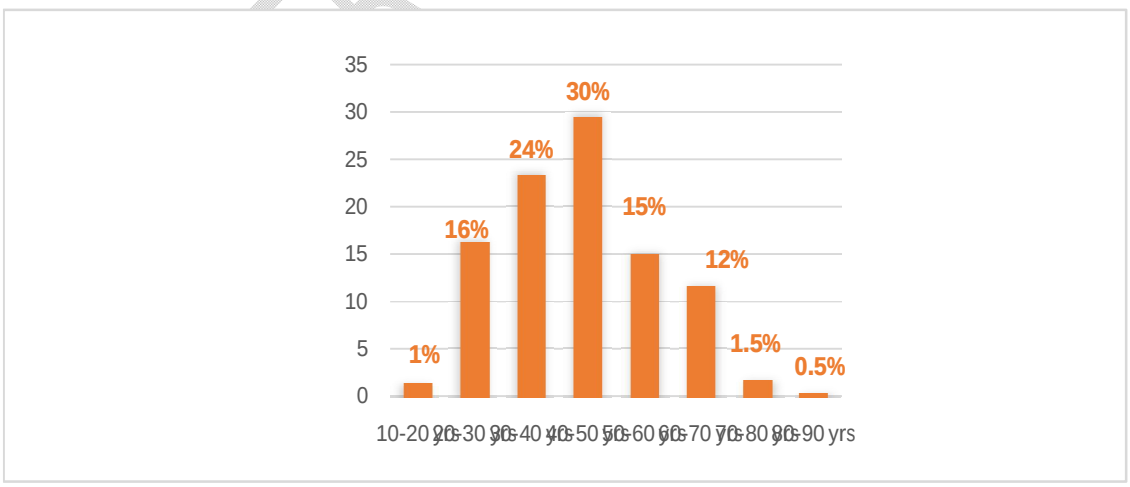
The present study involved a total of 213 patients that were reported positive for OL, this was confirmed using the patient reports and clinical pictures.

It was noted that males showed a higher prevalence rate when compared to females. The majority of patients were males (88%) and the remaining 12% were females giving an M: F ratio of 7: 1 (Graph 1).



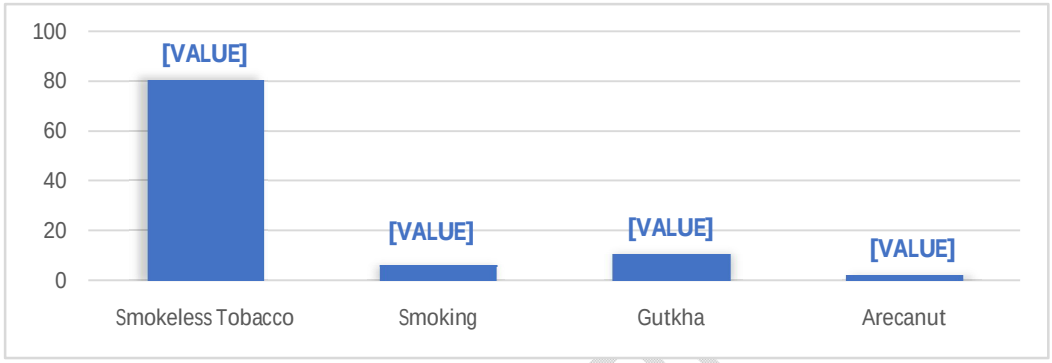
Graph 1: Graph representing percentage distribution of OL cases in Males and Females

The study population varied in age range from 10 – 90 years, with the mean, affected age group being 30-50 years. A majority of 30% of the affected population was in the 41 to 50 age group category followed by 24% in the 31 to 40 age group category suggesting middle age predilection of the disease.(Graph 2)

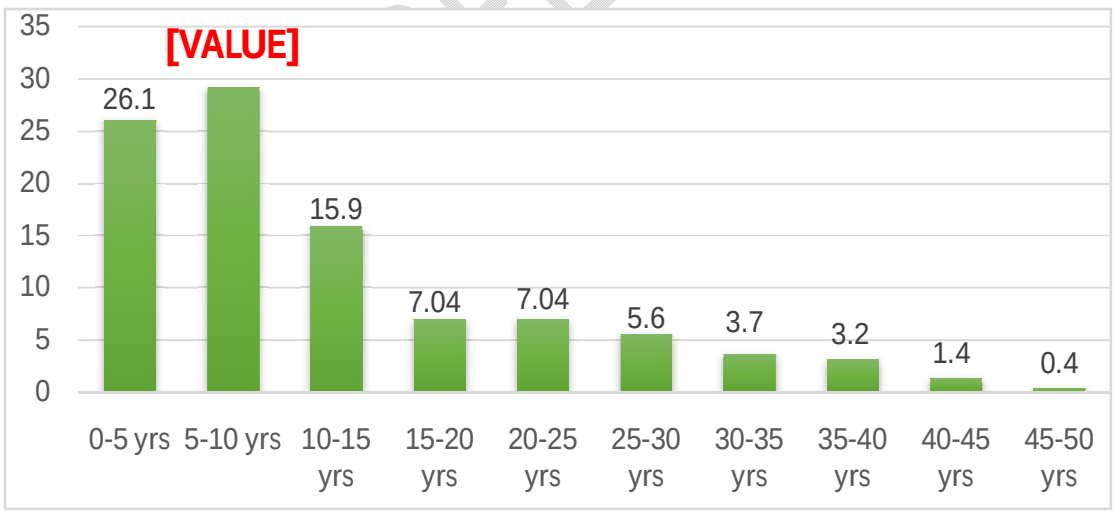


Graph 2: Graph representing percentage distribution of OL cases in different age group

Regarding tissue habits, smokeless tobacco was found to be the most common habit prevalent in the area. About 81% of population was involved in habits involving smokeless tobacco, followed by guthkha, smoking and arecanut as represented in Graph 3.[9] The duration of these habits was also calculated which showed that tobacco consumption for 5-10 years duration (approximately 30% cases) was enough to cause the disease.(Graph 4)

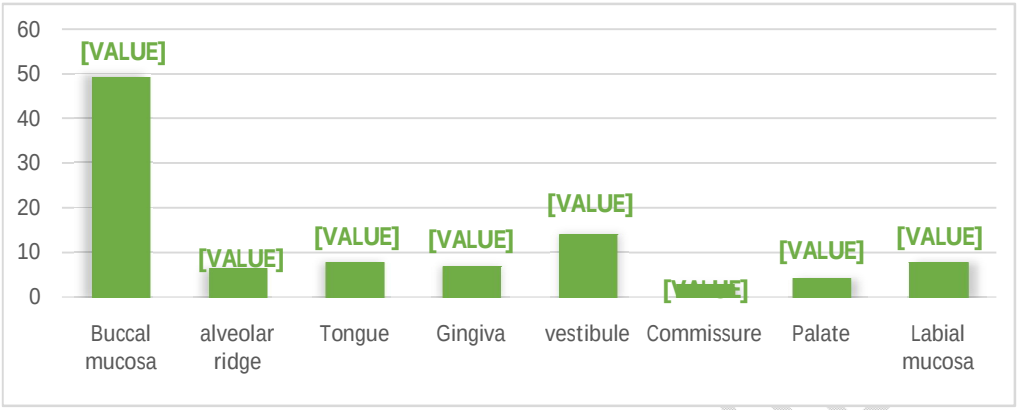


Graph 3: Graph representing percentage distribution of various tissue habits causing OL



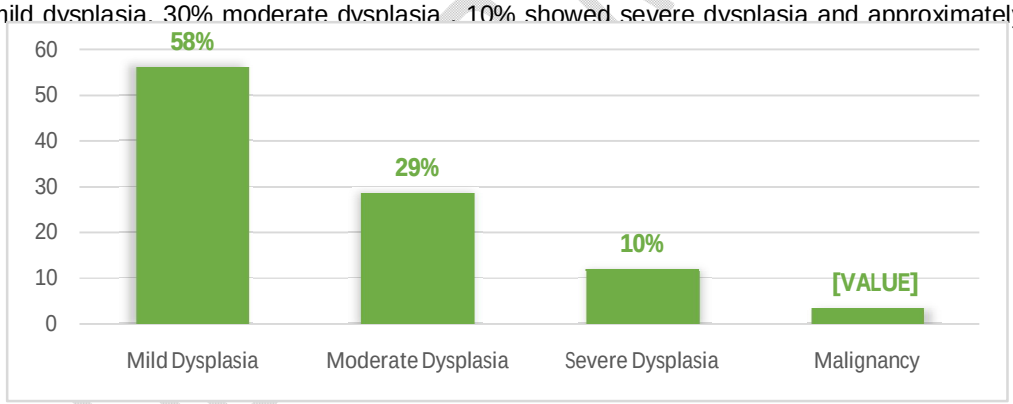
Graph 4: Graph representing percentage distribution of duration of habits among patients

Overall, buccal mucosa was the most common site involved (49%), followed by vestibule (14%), labial mucosa and tongue (8%), alveolar ridge and gingiva (7%), and lastly commissures and palate (3-4%).(Graph 5)



Graph 5: Graph representing different sites of involvement in cases of OL

Histopathologically, varying degrees of epithelial dysplasia was noticed in which, 57% showed mild dysplasia, 30% moderate dysplasia , 10% showed severe dysplasia and approximately 3% of the



Graph 6: Graph representing percentage distribution of Histopathological findings of OL

Oral leukoplakia is an oral potentially malignant disorder widespread among Indian population.[9] According to WHO (2005), it is defined as “a white plaque of questionable risk having excluded (other) known diseases or disorders that carry no increased risk for cancer”. .It denotes a diagnosis based on exclusion criteria clinically.[11] The lesions that need to be excluded to diagnose OL are: White sponge nevus, frictional keratosis, morsicatio buccarum, chemical injury, acute

pseudomembrane candidiasis, lichen planus or lichenoid reactions, discoid lupoid erythematosus and hairy leukoplakia. [6] The overall prevalence rate for OL ranges from 1-5%.

Risk factors include smokeless and smoked forms of tobacco including cigar, cigarette, beedi, and pipe. Other synergistic risk factors include alcohol consumption, chronic irritation, fungal infections such as candidiasis, HPV -16 and HPV-18 , oral galvanism due to restorations, sexually transmitted lesions like syphilis, or combination of the above.[9]

When a tissue cell is exposed to a carcinogen (any type), it probably tries to adapt to it. An increase in cell proliferation, shrinking the cytosolic capacity and the allied organelle load, could be an effort in adaptation. In the framework of oral epithelium, a hastened growth phase represented by augmentation of the progenitor compartment (hyperplasia) is the earlier sequelae, and when the irritant persists further, the epithelium shows features of cellular degeneration, a well-characterized feature of adaptation (atrophy). When the stage of adaptation and revocable cell damage ends, the cells gradually reach a stage of irrevocable cell damage, manifesting as either apoptosis or malignant transformation. As an adaptative response, the hastened pace of cell division noted at the earlier stages of transformation facilitates further genetic damage, thereby forcefully pushing the cells further along the path to malignant transformation.[12]

There are different forms of leukoplakia which are as follows:

1. Homogeneous (lesions that are uniformly white) : Smooth/Fissured/Ulcerated
2. Non Homogeneous (Well demarcated raised white areas interspersed with reddened areas)
3. Proliferative Verrucous Leukoplakia
4. Candidal Leukoplakia
5. Syphilitic Leukoplakia
6. Hairy Leukoplakia
7. Idiopathic Leukoplakia

The homogeneous type is usually asymptomatic, whereas the non-honmogeneous type is often associated with increased chances of malignancy.

This study looked into the association of leukoplakia with age, gender, and tobacco usage, to map out its prevalence and thus assess its course. The present study involved 213 patients that were

reported positive for OL, which was confirmed using the patient's retrospective records. The study revealed gender predilection of the disease. It is generally noted that males showed a higher prevalence rate as compared to females as is justified by more prevalence of tissue abuse habits in males.[9] Our study showed similar findings with a male: female ratio of 7:1. Maximum cases of OL, in other studies, have been observed to affect individuals in the age range of 41 to 60 years. In this study, approximately 45% of the population affected was in the age group of 41-60 years similar to previous studies.

Tobacco usage is the most important known etiological factor in the development of OL, followed by paan, guthka and arecanut. Patients with such tissue abuse habits have a six-fold increased risk of developing OL.[8] In accordance with the previous data, our study also revealed 80% of the patients possessing habit of tobacco consumption, making it the most common etiological agent in our study population. None of the cases depicted the occurrence of leukoplakia in the absence of any tissue abuse habit.

OL can develop on any surface of the oral mucosa with the most commonly described locations being the mandibular vestibule (25.2% - 40%), buccal mucosa (21.9% - 46%), palate (27%) or tongue (26%) and floor of mouth (19.3%). Most patients were present with multifocal disease.[10] . Similarly, in our study, half of the study population depicted lesions in buccal mucosa (50%) followed by vestibular region (14%), followed by other sites including alveolar ridge, tongue, gingiva and palate in decreasing order of their frequencies of occurrence. The common site relates with the placement of tobacco pouch or quid in the vestibule.

Though OL is initially diagnosed on clinical examination alone, there are various lesions that should be considered in the differential diagnosis of OL. These include white sponge nevus, frictional keratosis, morsicatio buccarum, chemical injury, acute pseudomembranous candidiasis, lichen planus (plaque type), kichenoid reactions, discoid lupus erythematosus, skin graft, hairy leukoplakia and stomatitis nicotina. Hence,clinical decision-making is driven by the histologic findings of a biopsy. Most OLs appear as benign keratosis, hyperkeratosis, or hyperplasia with a minority of lesions demonstrating some degree of dysplasia and rare lesions demonstrating OSCC.[10] In our study, varying degrees of dysplasia was observed histopathologically, with mild epithelial dysplasia (56%) being the most common finding, followed by moderate (29%) and severe dysplasia (10%).

The clinical importance of OL derives almost entirely from its identity as a precursor to oral squamous cell carcinoma (OSCC). Long-term, observational, population-based studies have provided us with the best estimates of the likelihood of malignant transformation.[10] According the recent studies, the malignant transformation rate of OL ranges from 3-17%.

The factors that increase the risk for malignant transformation of OL include: female gender, long duration of lesion, leukoplakia in non-smokers (idiopathic leukoplakia), lesion on the tongue and/or floor of the mouth, size of the lesion greater than 200 mm, non-homogeneous type, presence of Candida albicans and presence of epithelial dysplasia.

Proliferative verrucous leukoplakia (PVL) is an unusual form of oral leukoplakia that is typically multi-focal, persistent, has a tendency to recur and evolves into exophytic lesions that resemble verrucous carcinoma. Most importantly, PVL has a high risk for becoming dysplastic and transforming into squamous cell carcinoma.

Likewise, in our study , 3% of the cases showed features of oral squamous cell carcinoma on histopathological examination, which were clinically diagnosed as OL on lateral border of tongue. Similar results were found in earlier studies which showed that carcinoma and dysplastic changes are more prone to occur on lateral borders of tongue and floor of mouth.[14,15] The higher risk in tongue and floor of mouth may be attributed to more exposure from carcinogens pooled in saliva than other areas of oral cavity. Trauma from sharp cusps can also be considered as a cofactor for such lesions. The low degree of keratinization and higher permeability of mucosa in these regions may also enhance the effect of oral carcinogens as compared to other sites.[16]

Follow-up and clinical examinations are mandatory for early diagnosis and to prevent disease progression.[13] Initial management of a patient with suspected OL begins with a careful history and physical examination. Important components of the history should include timing of onset, progression, and presence of pain or sensitivity. Risk factors, such as tobacco and alcohol use, must be elicited.[10] Oral brush biopsies or toluidine blue and optical spectroscopy have all been proposed as efficient ways for screening oral leukoplakia that avoid taking a biopsy. For example, the Velscope is a commonly used office based imaging device that relies on tissue fluorescence to help dentists differentiate between normal and dysplastic lesions.[17,18,19]

Treatment of leukoplakia is primarily driven by the degree of dysplasia seen on biopsy. In general, elimination of risk factors like tobacco abuse, betel chewing and alcohol abuse is the prior

action in the treatment. Conservative treatment includes chemopreventive agents like vitamins (A,C,E), Vitamin A analogues (fenritinide), and carotenoids (beta carotene, lycopene), bleomycin (cytotoxic antibiotic).the use of photodynamic therapy has also been reported. (3). Surgical treatment still remains the method of choice in OL with histopathologically diagnosed epithelial dysplasia. This includes conventional surgery, electrocoagulation, cryosurgery and CO2 laser. Close surveillance and follow-up is mandatory at periodic intervals as it may prevent the development of malignancy.

CONCLUSION

Oral cancer is on the rise and so are the occurrences of the premalignant lesions. Understanding its epidemiology can greatly help in retarding its progression and thus preventing further complications. This study has thus correlated OL prevalence with age, gender, and tobacco usage to focus on factors most associated with its occurrence and hence help provide better strategies to control the same.[9]

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