ORIGINAL RESEARCH

Pathological portraits: The clinicopathological spectrum of oral mucosal epithelial lesions

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ABSTRACT

Introduction: Oral mucosal lesions range from benign to malignant, with oral squamous cell carcinoma (OSCC) being the most common malignancy. OSCC is a major health issue in developing countries such as India, where its incidence is notably high due to risk factors such as tobacco use and smoking. Early detection of potentially malignant lesions, including oral leukoplakia and erythroplakia, is crucial for improving outcomes. **Aims and Objectives:** The study aimed to observe the spectrum of oral mucosal epithelial lesions at a tertiary care institute. **Materials and Methods:** In 1-year duration, 75 patients with clinically suspicious oral mucosal lesions were included in the study. After obtaining informed consent, biopsies were performed. Clinical data, including demographic information and personal habits, were documented. Tissue samples were processed using Hematoxylin and Eosin staining and reported as benign non-specific inflammatory lesions, pre-malignant (squamous intraepithelial neoplasia or SIN), and malignant (squamous cell carcinoma or SCC). Data analysis focused on lesion distribution and clinical correlations. **Results:** The study cohort was predominantly male (88%) with a mean age of 49.62 ± 12.58 years, most commonly in the 41–50-year age group (38.7%). A high prevalence of smoking (53.3%) and tobacco chewing (58.6%) was noted. The buccal mucosa was the most frequently affected site (81.3%). Clinically, non-healing ulcers were observed in 48% of cases. Histopathological findings revealed SCC in 68% of lesions (with moderately differentiated carcinoma being the most prevalent grade), benign non-specific inflammatory changes in 13.4%, and SIN in 18.6%, with SIN-I being the most common grade. **Conclusion:** The study highlights a significant prevalence of potentially malignant and malignant oral lesions, especially among males and those with tobacco-related habits. The high rate of OSCC emphasizes the need for early detection and intervention. Enhancing public awareness and improving access to diagnostic services are essential for effective management. Routine clinical and histopathological assessments remain critical for accurate diagnosis and timely treatment.

KEY WORDS: Oral mucosal lesions, squamous cell carcinoma, tobacco use, early detection, histopathology, India

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INTRODUCTION

The oral cavity, representing the uppermost part of the digestive tract, is lined by a mucous membrane composed of stratified squamous epithelium.[1] This epithelium is subjected to various pathological changes, leading to a spectrum of lesions that range from benign to malignant. Among these, oral squamous

cell carcinoma (OSCC) is the most prevalent malignancy, particularly in developing countries, where it constitutes over 90% of all oral cancers.[2]

OSCC is a significant public health concern, with an annual global incidence exceeding 500,000 cases, and it ranks as the 17th most frequent cancer worldwide.[2,3] It is particularly prevalent in regions such as India, being the most common cancer among men and the third most common overall. The etiology of OSCC is strongly associated with risk factors such as smoking, alcohol consumption, and the use of tobacco in various forms. These factors, alone or in combination, significantly increase the risk of developing oral cancer.[4,5]

A substantial percentage of OSCC cases are preceded by pre-malignant or potentially malignant lesions, such as oral leukoplakia, erythroplakia, lichen planus, oral submucous fibrosis, and actinic cheilitis. These lesions represent a critical stage in the carcinogenic process, where early detection and intervention can significantly improve patient outcomes. Dysplasia or intraepithelial neoplasia, observed microscopically in these lesions, is a key indicator of their potential to progress to malignancy.[6]

Early diagnosis of oral mucosal lesions, particularly those with malignant potential, is crucial for improving prognosis and survival rates. However, many pre-malignant lesions and a significant number of early-stage malignancies are clinically subtle and asymptomatic, leading to delays in diagnosis and treatment.[7] This delay often results in a poorer prognosis, underscoring the importance of awareness and early detection strategies.

Given the high prevalence of oral mucosal epithelial lesions and their potential to progress to OSCC, understanding their clinicopathological spectrum is essential. This study aims to provide a comprehensive overview of the types of oral mucosal lesions encountered at our institute, their distribution, and associated clinical factors, thereby contributing valuable data to the ongoing efforts to improve early detection and treatment strategies.

MATERIALS AND METHODS

This study, conducted in a 1-year period at Rohilkhand Medical College and Hospital, Bareilly, India, aimed to observe the spectrum of oral mucosal epithelial lesions.

The study included all biopsy specimens referred to the Department of Pathology for histopathological examination from patients with clinically suspicious oral mucosal lesions. Patients with inadequate biopsies or oral submucous fibrosis were excluded from the study. Clinical details, including demographic information and personal habits such as smoking and alcohol consumption, were documented. Lesions were categorized under benign non-specific inflammatory changes (including either non-inflammatory or non-specific inflammatory lesions), pre-malignant (SIN, further subclassified into grade I, II, and III), and malignant lesions (SCC, further graded as well, moderately, or poorly differentiated).

The data were analyzed to determine the distribution of different types of oral mucosal epithelial lesions and their clinical correlations. The frequency and types of lesions observed were summarized, highlighting their prevalence and associated clinical factors.

RESULTS

In the study, 75 patients with clinically suspicious oral mucosal lesions were evaluated. The patient cohort predominantly comprised individuals aged 41–50 years (Table 1), accounting for 38.7% of cases, followed by those aged 31–40 years (22.6%) and 51–60 years (20%). The mean age of the participants was 49.62 ± 12.58 years.

A notable male predominance was observed, with 88% of the patients being male and 12% female (Figure 1), indicating a higher incidence of oral mucosal lesions among males. Regarding lifestyle factors, smoking was reported in 53.3% of the patients, tobacco chewing in 58.6%, and alcohol consumption in 24.6%.

As shown in Table 2, the buccal mucosa emerged as the most frequently affected site, involved in 81.3% of cases. This was followed by the retromolar trigone and palate, which were affected in 6.9% and 6.6% of cases, respectively.

Clinically, the most common presentation (Figure 2) was non-healing ulcers, observed in 48% of the patients. This was followed by non-specific papular lesions (14.6%) and ulceroproliferative lesions (13.3%). Other presentations included homogenous leukoplakia (8.0%), non-homogenous leukoplakia (5.4%), erythroplakia (5.4%), and erythroleukoplakia (1.3%).

Histopathological examination revealed benign non-specific inflammatory changes in 13.4% of cases (Table 3). SIN was identified in 18.6% of the cases, with SIN-I being the most common grade, observed in 8.0% of cases. OSCC was diagnosed in 68.0% of the cases, reflecting a significant prevalence of malignancy among the study population.

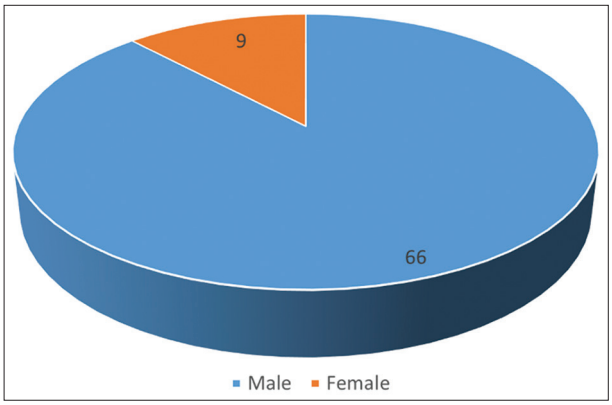

Figure 1: Gender distribution of patients

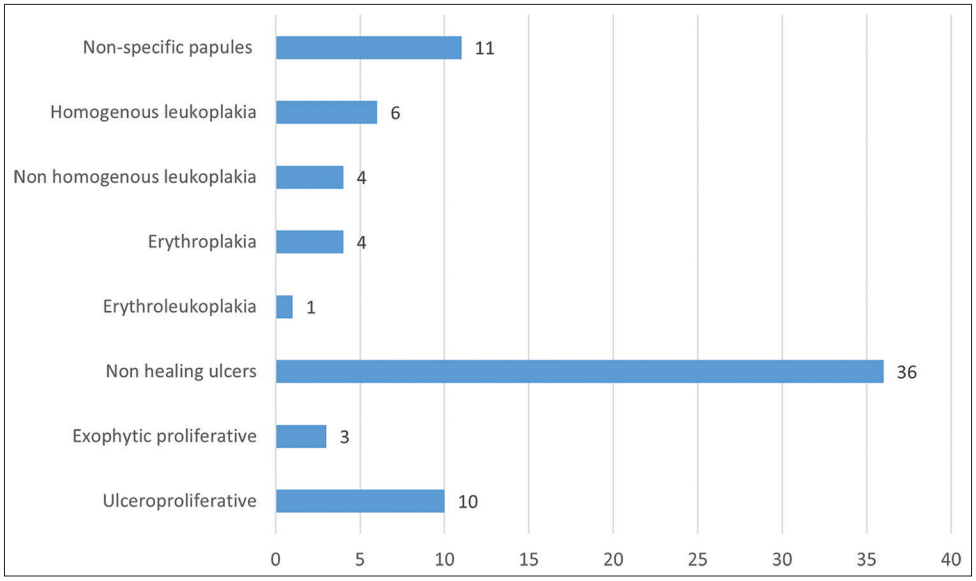

Figure 2: Clinical appearance of lesions

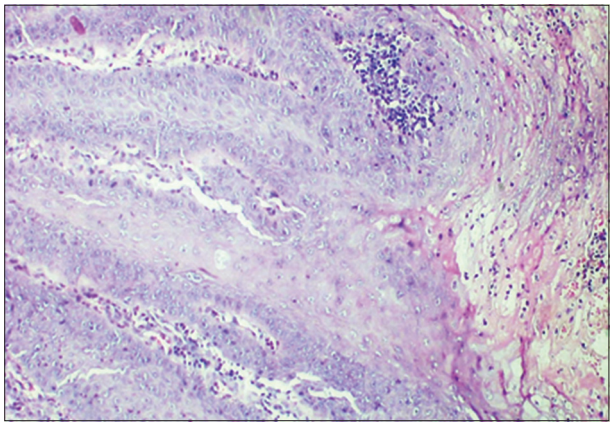

Figure 3: Tissue biopsy section showing SIN-II (H&E, 100×)

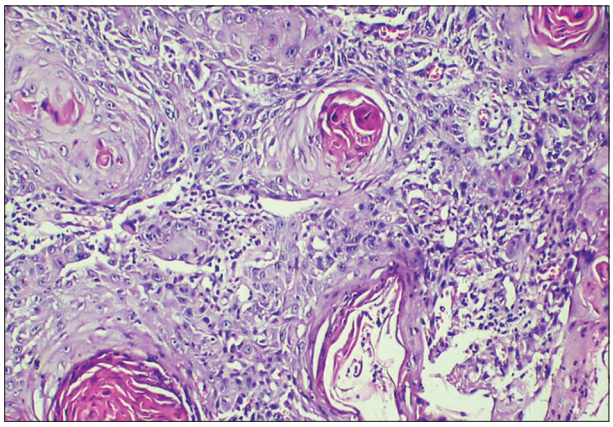

Figure 4: Tissue biopsy section showing MDSCC (H&E, 100×)

DISCUSSION

The findings of the present study offer a comprehensive overview of the demographic and clinical characteristics of oral mucosal lesions and provide important comparisons with existing literature.

Table 1 : Clinical profile of study subjects

Parameter	Frequency	Percentage
Age		
21–30	5	6.7
31–40	17	22.6
41–50	29	38.7
51–60	15	20.0
61–70	4	5.3
71–80	5	6.7
Personal habits		
Tobacco use	44	58.6
Smoking	40	53.3
Alcohol	18	24.0

Table 2: Clinical site of involvement

Site of involvement	Frequency	Percentage
Buccal Mucosa	61	81.4
Palate	5	6.7
Floor Of Mouth	1	1.3
Vestibule	1	1.3
Labial Mucosa	1	1.3
Gingiva	1	1.3
Retromolar Trigone	5	6.7

The mean age of involvement in our study was 49.62 years, with the highest prevalence of lesions occurring in the 41–50-year age group. This aligns with studies by Astekar *et al.*[8] and Mehrotra *et al.*,[4] which also reported higher frequencies of lesions in older age groups. Notably, Agrawal *et al.*[9] observed a slightly younger mean age of 40.16 years, but both studies reflect a trend of increasing age-related incidence of oral mucosal lesions. The variance in age could be attributed to

Table 3: Histopathological diagnosis

Diagnosis on histopathology	Frequency (*n*=75)	Percentage
Benign non-specific inflammation	10	13.4
SIN		
SIN I	6	8.0
SIN II	5	6.6
SIN III	3	4.0
Total SIN	14	18.6
SCC		
Well-Differentiated (WDSCC)	7	9.3
Moderately Differentiated (MDSCC)	38	50.7
Poorly Differentiated (PDSCC)	6	8.0
Total SCC	51	68.0
Total	75	100.0

differences in study populations and regional factors influencing disease onset.

The study demonstrated a significant male predominance, with 88% of patients being male. This is consistent with findings from Agrawal *et al*.,[9] who also noted a male preponderance, although their study reported a slightly lower male-to-female ratio. The higher incidence of oral lesions in males in our study corroborates with observations from Iype *et al.*[10] and Mehrotra *et al*.,[4] which attribute the increased prevalence to higher tobacco and alcohol use among men.

Smoking and tobacco chewing were prevalent among the study population, with 53.3% and 58.6% of patients, respectively, engaged in these habits. This prevalence aligns with regional patterns and supports the findings of Agrawal *et al*.,[9] who noted high rates of tobacco use in their cohort. The buccal mucosa was the most commonly affected site (81.3%), reflecting a trend observed in other studies, including those by Modi *et al.*[11] and Mehrotra *et al.*[4] Agrawal *et al.*[9] also identified similar trends, though they reported a higher frequency of lesions on the tongue, which may relate to regional differences in tobacco use patterns.

Clinically, non-healing ulcers were the most common presentation, seen in 48% of cases. This finding is consistent with Agrawal *et al*.,[9] who noted that non-healing ulcers were a prevalent clinical presentation in their study as well. Other presentations in our study included papular lesions, leukoplakia, and erythroplakia, illustrating a spectrum of oral mucosal changes.

Histopathological examination (Figures 3 and 4) revealed that 68% of the lesions were OSCC, a higher proportion compared to some other studies. Agrawal *et al.*[9] observed similar trends with a high prevalence of malignant lesions. The increased rate of OSCC in our study may be attributed to the selection of patients with clinically suspicious lesions, as opposed to broader demographic groups in other studies. Among the 51 cases of OSCC in the study, well-differentiated carcinoma accounted for seven cases, moderately differentiated for 38 cases, and six cases were poorly differentiated carcinoma. These results align with those of Ayaz *et al*.,[12] who found that 48% of their patients had moderately-differentiated carcinoma. In contrast, Astekar *et al.*[8] showed an overall dominance of well-differentiated carcinoma, as did Iype *et al.*[10] The variation may be due to differences in the demographic profile of patients attending the respective institutes and the grading criteria employed. About 13.4% of cases were determined to be benign non-specific inflammatory changes, and 18.6% as SIN, with SIN-I being the most frequent grade. These results align with the general literature but show a higher prevalence of OSCC compared to studies by Kumar *et al*.,[13] and Goyal *et al*.,[14] possibly due to the referral nature of our patient population.

CONCLUSION

The study emphasizes the significant prevalence of potentially malignant and malignant oral lesions in the region, largely attributable to prevalent habits such as tobacco use and smoking. The findings reveal a high incidence of OSCC and other lesions, particularly among males and individuals with specific deleterious habits.

The results highlight the critical need for early detection and intervention in managing oral mucosal lesions. Routine clinical examination and histopathological assessment are essential for accurately identifying and differentiating between benign, pre-malignant, and malignant conditions.

Given the high frequency of malignant lesions observed, enhancing public awareness about the risks associated with oral habits and improving access to diagnostic services are paramount. Health professionals should remain vigilant in the assessment of oral lesions and encourage early evaluation of suspicious cases.

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