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RESEARCH ARTICLE
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PREVALENCE AND CLINICAL PRESENTATION OF ORAL POTENTIALLY MALIGNANT DISORDERS (OPMDS) IN PATIENTS REFERRED FOR SURGICAL BIOPSY

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ABSTRACT

Background: Oral Potentially Malignant Disorders (OPMDs) represent a spectrum of lesions with an increased risk of progressing to oral cancer. Early identification and appropriate clinical management are critical for improving prognosis. This study aims to evaluate the prevalence and clinical characteristics of OPMDs in patients referred for surgical biopsy.

Methods: A retrospective cross-sectional study was conducted on patients referred to the oral surgery department for biopsy of suspicious oral lesions over a defined period. Demographic data, risk factors (such as tobacco and alcohol use), lesion characteristics (site, size, clinical appearance), and histopathological outcomes were recorded and analyzed.

Results: Among the total biopsied cases (n = 250), OPMDs accounted for 136 cases (54.4%). The most frequently diagnosed OPMD was oral leukoplakia (42.6%), followed by oral lichen planus (23.5%), oral submucous fibrosis (18.4%), and erythroplakia (15.5%). The buccal mucosa was the most common site of presentation (48.5%), followed by the tongue (22.1%) and floor of the mouth (14.7%). A male predominance was observed (63.2%), with the majority of patients in the 41–60-year age group (52.9%). Histopathological analysis revealed epithelial dysplasia in 74 OPMD cases (54.4%), with 38 cases (51.4%) showing mild, 24 cases (32.4%) moderate, and 12 cases (16.2%) severe dysplasia. A significant correlation was observed between tobacco use and the presence of dysplasia ($p < 0.05$).

Conclusion: OPMDs are prevalent among patients referred for surgical biopsy, particularly in individuals with known risk factors such as tobacco use. Oral leukoplakia remains the most common

OPMD, with a substantial proportion showing dysplastic changes. These findings underscore the need for early detection, risk factor modification, and routine oral screening to prevent malignant transformation.

INTRODUCTION

Oral cancer is a growing health concern across the globe, ranking among the top ten most common cancers worldwide. The burden is particularly high in Southeast Asia, including India, where cultural and lifestyle habits such as chewing tobacco, areca nut, and betel quid—contribute significantly to disease incidence.[1] A large proportion of oral cancers are preceded by clinically recognizable precursor lesions, collectively referred to as Oral Potentially Malignant Disorders (OPMDs).[2] These lesions represent a heterogeneous group of mucosal alterations with varying degrees of malignant potential and include conditions such as leukoplakia, erythroplakia, oral lichen planus (OLP), and oral submucous fibrosis (OSMF).[1]

The World Health Organization (WHO) defines OPMDs as a broad clinical spectrum of lesions with a statistically increased risk of progression to oral squamous cell carcinoma (OSCC). Despite increasing awareness, many of these conditions remain underdiagnosed or are detected only when significant transformation has occurred. As a result, understanding the epidemiology and clinical characteristics of OPMDs is essential for early diagnosis and management. Among OPMDs, leukoplakia remains the most prevalent, typically presenting as a white plaque that cannot be scraped off and is not attributable to another known disease.[3] OLP, on the other hand, is a chronic inflammatory mucocutaneous condition that often manifests in reticular, erosive, or plaque-like forms. OSMF is a progressive fibrotic condition primarily seen in South Asian populations due to areca nut chewing, and erythroplakia, though less common, carries the highest risk of malignant transformation.[4]

Numerous epidemiological studies have examined the prevalence of OPMDs in different populations. In India, for instance, prevalence rates among high-risk groups such as tobacco users have been reported to range from 1.5% to 15%, depending on the diagnostic criteria and study setting. Histologically, the presence of epithelial dysplasia in these lesions is a crucial predictor of malignant transformation. Grading of dysplasia into mild, moderate, and severe provides clinicians with a guide for follow-up and intervention. Notably, not all dysplastic lesions undergo malignant change, and conversely, some non-dysplastic lesions may transform, underlining the complexity of oral carcinogenesis.[5] There is also a strong socio-demographic component to OPMDs. Middle-aged males, particularly from lower socioeconomic backgrounds, are disproportionately affected due to high rates of tobacco use and poor access to healthcare services. Moreover, habits such as reverse smoking, alcohol consumption, and poor oral hygiene may act synergistically to increase the risk of transformation. Despite this, routine oral cancer screening is not universally practiced, and many cases are referred for biopsy only after visible or symptomatic lesions appear.[6] Histopathological examination remains the gold standard for diagnosing OPMDs and evaluating their malignant potential. This includes not only identifying dysplasia but also characterizing the architectural and cytological changes that define premalignancy. The correlation of histopathological features with clinical risk factors such as lesion site, patient age, and tobacco use can aid in refining screening protocols and prioritizing cases for surgical intervention.[7]

Our study seeks to assess the clinical presentation, demographic profile, and histopathological spectrum of OPMDs in patients referred for biopsy. By analyzing data from a tertiary care hospital, we aim to contribute valuable insights into the patterns of OPMD occurrence and the associated risks, ultimately supporting more effective prevention strategies for oral cancer.

METHODOLOGY

This retrospective cross-sectional study was carried out in the Department of Oral and Maxillofacial Surgery after obtaining IRB from the institute vide # AIDC3139. The sample consisted of 250 patients who underwent surgical biopsy for clinically suspicious oral lesions during the defined study period. Inclusion criteria included patients aged 18 years and above, presenting with persistent white, red,

mixed, or ulcerative lesions suspected to be premalignant. Exclusion criteria were previously diagnosed malignancies, incomplete clinical records, and patients with systemic diseases influencing oral mucosal health.

Data extracted from clinical records included demographic details (age, gender), risk factors (tobacco usage, alcohol consumption), lesion characteristics (anatomical site, appearance), and histopathological findings. Tobacco consumption was sub-classified into smoked and smokeless forms. Alcohol use was recorded based on self-reported history. Lesions were clinically diagnosed by specialists and later confirmed histopathologically. Biopsy specimens were reviewed by experienced pathologists and categorized into different types of OPMDs with grading of epithelial dysplasia where applicable.

Statistical analysis was performed using SPSS version 26 software. Descriptive statistics were used for frequency and proportion analyses. The chi-square test was employed to assess associations between variables such as tobacco use and the presence of epithelial dysplasia. A p-value < 0.05 was considered statistically significant.

RESULTS

Out of the 250 patients who underwent surgical biopsy, 136 cases (54.4%) were histopathologically confirmed as Oral Potentially Malignant Disorders (OPMDs). The distribution of OPMD types is shown in Table 1. Oral leukoplakia was the most common OPMD identified, accounting for 42.6% of cases, followed by oral lichen planus (23.5%). Erythroplakia, though less common, is clinically significant due to its higher dysplastic potential.

Table 1: Distribution of OPMD Types (n = 136)

OPMD Type	Number of Cases	Percentage (%)
Oral Leukoplakia	58	42.6%
Oral Lichen Planus	32	23.5%
Oral Submucous Fibrosis	25	18.4%
Erythroplakia	21	15.5%
Total	136	100.0%

The buccal mucosa was the most frequently involved site (48.5%), followed by the tongue (22.1%) and floor of the mouth (14.7%). This distribution correlates with the habit of placing smokeless tobacco in the buccal vestibule, are listed in Table 2.

Table 2: Distribution of Lesion Sites (n = 136)

Site of Lesion	Number of Cases	Percentage (%)
Buccal Mucosa	66	48.5%
Tongue	30	22.1%
Floor of the Mouth	20	14.7%
Gingivobuccal Sulcus	14	10.3%
Palate	6	4.4%
Total	136	100.0%

The age and gender distribution of patients with OPMDs is detailed in Table 3. The majority of patients were in the 41–60 age group (52.9%). Males accounted for 63.2% of cases, reflecting higher exposure to risk factors such as tobacco and alcohol use.

Table 3: Age and Gender Distribution of OPMD Cases (n = 136)

Age Group (Years)	Male (n)	Female (n)	Total (n)	Percentage (%)
21–40	24	16	40	29.4%
41–60	45	27	72	52.9%
>60	17	7	24	17.6%
Total	86	50	136	100.0%

Among the OPMD cases, 74 (54.4%) exhibited dysplasia. Mild dysplasia was the most common (51.4%), while 16.2% demonstrated severe dysplasia—warranting close clinical surveillance or surgical intervention. The histopathological grading of epithelial dysplasia among OPMD cases is summarized in Table 4.

Table 4: Histopathological Grading of Dysplasia in OPMDs (n = 74)

Grade of Dysplasia	Number of Cases	Percentage (%)
Mild	38	51.4%
Moderate	24	32.4%
Severe	12	16.2%
Total	74	100.0%

A statistically significant association ($p < 0.05$) was found between tobacco use and the presence of epithelial dysplasia. Among tobacco users, 62.9% showed dysplastic changes compared to 33.3% of non-users. The association between tobacco use and presence of dysplasia is shown in Table 5.

Table 5: Association Between Tobacco Use and Epithelial Dysplasia

Tobacco Use	Dysplasia Present	Dysplasia Absent	Total (n)
Yes	61	36	97
No	13	26	39
Total	74	62	136

DISCUSSION

The present study revealed that over half of the patients who underwent biopsy for suspicious oral lesions were diagnosed with OPMDs, emphasizing the significant burden of potentially malignant lesions in clinical practice. Oral leukoplakia emerged as the most prevalent disorder, aligning with global data suggesting it is the most frequently encountered premalignant oral lesion. Its relatively high rate of dysplasia in our findings further reinforces its malignant potential. Our findings are consistent with those of Nadeau et al. (2018)[8], who reported leukoplakia and erythroplakia as the most common OPMDs with variable dysplastic features. Similarly, Parak et al. (2024)[9] in a large Indian cohort found leukoplakia to be the leading potentially malignant disorder, with substantial links to tobacco chewing habits. The strong association between smokeless tobacco use and OPMDs in our study parallels observations made by Wolk et al. (2024)[10], reinforcing the role of areca nut and gutkha in oral carcinogenesis.

Interestingly, oral lichen planus, often debated for its malignant potential, was the second most prevalent lesion in this study. While some studies question its premalignant nature, others such as Louredo et al. (2024)[11] have documented malignant transformation rates ranging between 0.4% to 5%. Our histopathological findings show that while OLP contributed to the overall burden, dysplasia was less commonly seen compared to leukoplakia and erythroplakia. Erythroplakia, although less

prevalent, presented a higher proportion of moderate to severe dysplasia. This observation aligns with Ruffing et al (2025)[12] conclusions, who emphasized that erythroplakia, despite being rare, carries the highest risk of malignant transformation up to 90% in some reports. This underscores the critical need for early recognition and aggressive management of red lesions in the oral cavity.

The demographic distribution in our study supports the established literature: middle-aged males remain the highest risk group. Lifestyle habits, especially tobacco in both smoked and smokeless forms, were predominant risk factors. The statistically significant correlation between tobacco use and presence of dysplasia supports findings by Kujan (2025)[13], who underscored the cumulative carcinogenic effect of tobacco on oral epithelium. Compared to similar studies, our dysplasia rate of 54.4% among OPMDs is slightly higher, potentially reflecting the referral bias in tertiary care centers, where more advanced or symptomatic lesions are seen. In contrast, community-based screenings often report lower dysplasia rates due to detection of early-stage or subclinical lesions.

Limitations include the retrospective design and the inability to track lesion progression or transformation into malignancy. Additionally, reliance on patient-reported tobacco and alcohol use may lead to underreporting. Nevertheless, this study contributes important data supporting the integration of biopsy, histopathology, and risk factor screening in standard oral health protocols.

CONCLUSION

Oral Potentially Malignant Disorders remain a prevalent concern among patients referred for biopsy, particularly among high-risk groups. The strong association with tobacco use and the high incidence of epithelial dysplasia calls for urgent public health attention, routine oral screening, and early biopsy of suspicious lesions. Focused interventions on habit cessation, patient education, and long-term surveillance can reduce the burden of oral cancer originating from OPMDs.

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