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Incidence of oral potentially malignant disorders requiring surgical excision in young vs elderly populations

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ABSTRACT

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Aim To compare the incidence and clinical presentation of oral potentially malignant disorders (OPMDs) necessitating surgical excision in younger and older populations, and to assess age-related variations in lesion characteristics, surgical outcomes, and potential risk factors. Methods Across-sectional observational study was performed on 100 patients who underwent surgical excision of oral potentially malignant disorders (OPMDs). Patients were categorised into two groups: young (n=40) and elderly (n=60). Demographics, risk factors, lesion characteristics, histopathology, and postoperative outcomes, including recurrence and malignant transformation, were documented. Statistical analysis encompassed descriptive statistics, Chi-square tests, and logistic regression; a p-value of <0.05 was deemed significant. Results Younger patients were more likely to chew areca nuts, while older patients were more likely to smoke and drink alcohol. OSMF was more common in younger patients, while non-homogeneous leukoplakia and erythroplakia were more common in older patients. Younger patients were more likely to have mild dysplasia, while older patients were more likely to have moderate to severe dysplasia. Recurrence transpired in 16.7% of elderly patients compared to 5% of younger patients (p=0.04), and malignant transformation was noted exclusively in the elderly cohort (6.7%). conclusion younger patients with OPMDs mostly have OSMF and mild dysplasia, while older patients have more advanced dysplasia, recurrence, and malignant transformation. To get the best results, you need to do risk assessments based on age, come up with preventive measures, and keep a close eye on things.

Introduction

Oral potentially malignant disorders (OPMDs) are a heterogeneous collection of mucosal lesions with a heightened risk of evolving into oral squamous cell carcinoma (OSCC), a significant contributor to cancer morbidity

and mortality globally. Leukoplakia, erythroplakia, oral lichen planus, oral submucous fibrosis (OSMF), and actinic cheilitis are some of the most common OPMDs [1]. It is very important to find and treat the problem early because the rates of malignant transformation can be anywhere from 1% to 36%, depending on the type of lesion, how long it lasts, and the patient's risk profile [2].

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The global pooled prevalence of OPMDs is estimated to be around 4.47%, with significant geographic disparities, especially elevated prevalence in South and Southeast Asia, primarily attributable to tobacco and areca nut consumption [3,4]. OSMF and leukoplakia are two of the most common OPMDs reported in India. This is because of the way people live and the risks they face [5]. Age is an important factor in the study of OPMDs and how to treat them. While the disorders are more prevalent in middle-aged and elderly individuals due to cumulative exposure to carcinogens [6], emerging evidence suggests an increasing incidence among younger populations, likely attributable to early initiation of tobacco and areca nut chewing [7]. Such trends are clinically significant, as OPMDs in younger individuals may exhibit distinct biological behaviour, healing capacity, and recurrence risk post-treatment in contrast to elderly patients. Surgical excision is a significant therapeutic approach for OPMDs, especially for lesions exhibiting moderate to severe dysplasia or those that do not respond to conservative management [8]. Nonetheless, there is a paucity of research directly comparing the incidence of OPMDs necessitating surgical excision between younger and older populations. Comprehending these age-related disparities is crucial for customising management approaches and enhancing long-term results. Thus, this article seeks to assess the prevalence of oral potentially malignant disorders (OPMDs) necessitating surgical excision in young versus elderly populations, and to examine age-related variations in lesion characteristics, surgical outcomes, and potential risk factors.

Methodology

This was a cross-sectional observational study performed in the Department of Oral and Maxillofacial Surgery/ Oral Medicine during a specified study period January 2018 to December 2023. All patients diagnosed with oral potentially malignant disorders (OPMDs) who underwent surgical excision were included. Patients were divided into two age groups for comparison: young (≤ 40 years) and elderly (≥ 60 years). Patients were included only if they had complete demographic, clinical, surgical, and histopathological records. Patients with a history of oral cancer, immunocompromised status, or incomplete records were not included. We used a structured proforma to collect data from case files. This included information about the patient's demographics, risk factors (tobacco, areca nut, alcohol), the lesions' clinical characteristics (site, size, type), surgical indications, intraoperative details, histopathological findings, and postoperative outcomes like complications, recurrence, and malignant transformation. Surgical excision

was warranted for lesions exhibiting moderate to severe dysplasia, clinically suspicious characteristics, functional impairment, or persistence despite conservative management. The World Health Organisation (WHO) 2017 criteria were used to grade dysplasia in all samples, which were processed according to standard histopathology protocols. We used SPSS (version 25) to do the statistical analysis. Descriptive statistics summarised the data, while group comparisons utilised the Chi-square test for categorical variables and either the independent t-test or Mann-Whitney U test for continuous variables, as suitable. Logistic regression analysis was utilised to determine independent predictors of surgical excision and dysplasia severity, whereas recurrence and malignant transformation were evaluated through Kaplan-Meier survival analysis when follow-up data were accessible. A p-value of < 0.05 was deemed statistically significant. The Institutional Ethics Committee gave its approval for the study, and patient privacy was protected the whole time.

Result

The study comprised 100 patients with oral potentially malignant disorders (OPMDs) who underwent surgical excision. Of these, 40 patients (40%) were under 40 years old and 60 patients (60%) were over 60 years old. The overall male-to-female ratio was 70:30, and there were more males than females in both age groups. Risk factor analysis indicated that areca nut chewing was prevalent among younger patients (45%) in contrast to the elderly (16.7%), whereas smoking (40%) and alcohol consumption (33.3%) were more commonly reported by elderly patients. Chewing tobacco was common in both groups (Table 1). The analysis of lesion distribution indicated that leukoplakia was the predominant oral potentially malignant disorder (OPMD). Homogeneous leukoplakia manifested with comparable frequency in both cohorts, whereas non-homogeneous leukoplakia and erythroplakia were more prevalent among elderly patients. Conversely, oral submucous fibrosis (OSMF) was primarily noted in younger individuals (37.5%). Both groups had the same number of cases of oral lichen planus with dysplasia (Table 2). Histopathological analysis demonstrated notable age-related disparities. In the younger group, mild dysplasia was the most common finding (50%), while moderate to severe dysplasia was more common in the older group (33.3% and 28.3%, respectively). Severe dysplasia/carcinoma in situ (CIS) was almost three times more common in older people (28.3%) than in younger people (10%) (Table 3). Postoperative outcomes revealed that the majority of patients experienced uncomplicated healing; however, complications such as delayed healing and wound dehiscence were marginally elevated in elderly patients (13.3% vs. 7.5%). Positive or

close surgical margins were also more common in older people (10% vs. 5%). During follow-up, the recurrence rate was significantly elevated in elderly patients (16.7% vs. 5%; $p = 0.04$). Four elderly patients (6.7%) exhibited malignant transformation, while the younger cohort showed no instances of malignant transformation (Table 4). The findings indicate that younger patients are more prone to exhibit OSMF and mild dysplasia, whereas older patients demonstrate a greater prevalence of non-homogeneous leukoplakia, advanced dysplasia grades, recurrence, and malignant transformation following surgical excision.

Table 1. Demographic and risk factor distribution of patients with OPMDs requiring surgical excision

Variable	Young (≤40 yrs) (n=40)	Elderly (≥60 yrs) (n=60)	Total (n=100)
Male : Female ratio	28:12	42:18	70:30
Tobacco chewing (%)	25 (62.5%)	28 (46.7%)	53 (53%)
Areca nut chewing (%)	18 (45%)	10 (16.7%)	28 (28%)
Smoking (%)	8 (20%)	24 (40%)	32 (32%)
Alcohol consumption (%)	6 (15%)	20 (33.3%)	26 (26%)

Table 2. Distribution of OPMD types according to age group

Lesion type	Young (≤40 yrs) (n=40)	Elderly (≥60 yrs) (n=60)	Total (n=100)
Leukoplakia (homogeneous)	10 (25%)	15 (25%)	25 (25%)
Leukoplakia (non-homogeneous)	5 (12.5%)	18 (30%)	23 (23%)
Oral submucous fibrosis (OSMF)	15 (37.5%)	5 (8.3%)	20 (20%)
Erythroplakia	2 (5%)	10 (16.7%)	12 (12%)
Oral lichen planus (with dysplasia)	6 (15%)	9 (15%)	15 (15%)
Others (specify)	2 (5%)	3 (5%)	5 (5%)

Table 3. Histopathological findings in excised lesions

Histopathological grade	Young (≤40 yrs) (n=40)	Elderly (≥60 yrs) (n=60)	Total (n=100)
No dysplasia	8 (20%)	5 (8.3%)	13 (13%)

Histopathological grade	Young (≤40 yrs) (n=40)	Elderly (≥60 yrs) (n=60)	Total (n=100)
Mild dysplasia	20 (50%)	18 (30%)	38 (38%)
Moderate dysplasia	8 (20%)	20 (33.3%)	28 (28%)
Severe dysplasia / CIS	4 (10%)	17 (28.3%)	21 (21%)

Table 4. Surgical outcomes and follow-up

Outcome	Young (≤40 yrs) (n=40)	Elderly (≥60 yrs) (n=60)	p-value
Uneventful healing (%)	35 (87.5%)	45 (75%)	0.12
Postoperative complications (%)	3 (7.5%)	8 (13.3%)	0.28
Positive/close margins (%)	2 (5%)	6 (10%)	0.33
Recurrence (%)	2 (5%)	10 (16.7%)	0.04*
Malignant transformation (%)	0 (0%)	4 (6.7%)	0.05*

*Statistically significant ($p < 0.05$).

Discussion

The current study examined the incidence and characteristics of oral potentially malignant disorders (OPMDs) necessitating surgical excision in young and elderly populations. The results show that there are clear differences in the distribution of lesions, histopathological grades, and surgical outcomes based on age. Younger patients primarily exhibited oral submucous fibrosis (OSMF) and mild dysplasia, while older patients demonstrated a greater incidence of non-homogeneous leukoplakia, erythroplakia, and severe dysplasia. Also, the rates of recurrence and malignant transformation were much higher in the older group. Our research corroborates previous findings indicating that oral potentially malignant disorders (OPMDs) are more prevalent in older adults, highlighting the cumulative impact of prolonged carcinogen exposure [9,10]. Leukoplakia is the most prevalent oral potentially malignant disorder (OPMD) worldwide, with non-homogeneous variants exhibiting greater malignant potential [11]. Consistent with our findings, older patients in prior studies exhibited a greater incidence of advanced dysplasia and malignant transformation [12]. Conversely, the prevalence of OSMF in younger individuals underscores the significance of early initiation of areca nut chewing in South Asian populations, as previously reported [13,14]. This indicates

an urgent need for public health interventions aimed at younger populations to mitigate future cancer incidence. Histopathological grading is essential for making management decisions. The current study identified moderate to severe dysplasia as more prevalent among elderly patients, aligning with the meta-analysis conducted by Arduino et al. [15], which indicated age as a risk factor for progression. Surgical excision is still the best way to treat lesions with dysplasia, but recurrence and malignant transformation are still problems. In our study, recurrence was markedly elevated in elderly patients, presumably attributable to field cancerisation and the existence of high-risk lesions. This finding is consistent with previous studies indicating that age, lesion type, and incomplete excision margins are significant predictors of recurrence [16,17]. The 6.7% rate of malignant transformation seen in older patients is similar to the 5–12% rates of transformation found in other studies [10,15]. It is important to note that there was no malignant transformation in the young group during the follow-up period, which further highlights the more aggressive clinical course of OPMDs in older individuals. Nonetheless, younger patients with OSMF should not be disregarded, as the risk of progression remains considerable with long-term follow-up [14]. This study's strengths encompass a direct age-based comparison and histopathological correlation. Nonetheless, the study's limitations encompass a relatively small sample size, a retrospective design, and restricted follow-up, potentially leading to an underestimation of long-term malignant transformation rates. In spite of these constraints, the study offers significant insights into age-related disparities in OPMDs necessitating surgical excision. In conclusion, OPMDs in young patients are more frequently associated with OSMF and mild dysplasia, whereas elderly patients exhibit a higher susceptibility to non-homogeneous leukoplakia, advanced dysplasia, recurrence, and malignant transformation. These results highlight the necessity of age-specific risk evaluation, diligent monitoring, and customised management approaches to enhance outcomes.

Conclusion

This study underscores notable age-related disparities in oral potentially malignant disorders (OPMDs) necessitating surgical excision. Younger patients primarily exhibited oral submucous fibrosis and mild dysplasia, whereas older patients demonstrated a greater incidence of non-homogeneous leukoplakia, advanced dysplasia, recurrence, and malignant transformation. These results highlight the necessity of age-specific risk evaluation, diligent monitoring, and prompt surgical intervention. To lower the burden of malignant progression and improve long-term outcomes, it is important to use preventive strategies that target high-risk

behaviours in younger people and to carefully manage and closely watch elderly patients.

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