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# Incidence of potentially malignant oral disorders in patients attending a private dental hospital

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ABSTRACT

Potentially malignant disorders are a heterogeneous group of lesions associated with the risk of malignant transformation to invasive cancer. Oral potentially malignant disorders (OPMDs) are considered as the early tissue changes that happen due to various habits such as smoking tobacco, chewing tobacco or stress. The rate of oral potentially malignant disorder transformation to malignancy is 2%–3%. The present study is a retrospective study in which 1000 patient records were reviewed and details such as gender, age, presence or absence of PMD, type of PMD were collected. Details were tabulated in excel, and results were obtained using SPSS. Chi-square analysis was performed to find out the association between different variables. Out of 1000 patients, 1.3% of patients had potentially malignant disorders out of which 77% were male, 23% were female. OSMF was present more in males (53.85%) which is followed by leukoplakia in males (23.08%). Females showed a predilection for lichen planus. The current study concluded the incidence of PMD as 13 per 1000 per year, and OSMF was found to be highest among the various potentially malignant disorders in the study population. This can be attributed to areca nut chewing habits which are high in Southeast Asia. More awareness programmes on the detrimental effects of tobacco & areca nut are necessary for effective prevention of potentially malignant disorder.

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## INTRODUCTION

WHO defined the term "Potentially malignant disorder" (PMD) as the risk of malignancy being present in lesion or condition either during the time of initial diagnosis or at a future data (Mortazavi *et al.*, 2014). Cancer of the oral cavity accounts for approximately 3% of all malignancies and found in 2,70,000 patients annually worldwide (Little *et al.*, 2018; Amagasa *et al.*, 2011). Primary oral squamous cell carcinoma is the most prevalent oral malignancy (Misra *et al.*, 2015). It is noteworthy that many oral squamous cell carcinomas develop from

potentially malignant disorders (Amagasa *et al.*, 2011; George *et al.*, 2011; Epstein *et al.*, 2008). The rate of oral potentially malignant disorder transformation to malignancy is 2%–3% (Venugopal and Maheswari, 2016; van der Waal, 2014). Oral potentially malignant disorders are Oral Submucous Fibrosis (OSMF), leukoplakia, erythroplakia, actinic cheilosis, oral lichen planus, palatal keratosis, discoid lupus erythematosus, dyskeratosis congenital and epidermolysis bullosa (Ganesh *et al.*, 2018; Warnakulasuriya *et al.*, 2007).

Habits such as tobacco and alcohol use predispose to PMD (Warnakulasuriya and Muthukrishnan, 2018). Scully *et al.* proved clinical and histopathological assessment of OPMD is not sufficient to predict malignant transformation (Scully, 2014). Hence, the only way to control and prevent the development of oral squamous cell carcinoma is through the analysis of clinical aspects (Warnakulasuriya *et al.*, 2007; Cyriac and Gopinath, 1982). The incidence of 1 to 5% of PMD was reported by Amagasa et al. (Amagasa *et al.*, 2011). According to the WHO, India is the second-largest consumer and third largest producer of tobacco, increasing the incidence of OPMD in India (Maheswari *et al.*, 2018).

(Choudhury, 2015; Dharman and Muthukrishnan, 2016) Previously our team had conducted numerous case studies (Muthukrishnan *et al.*, 2016; Muthukrishnan and Kumar, 2017) and systematic reviews (Venugopal and Maheswari, 2016; Chaitanya, 2017; Chaitanya *et al.*, 2018) and questionnaire-based studies (Subashri and Maheshwari, 2016; Warnakulasuriya and Muthukrishnan, 2018) and international validation study (Steele *et al.*, 2015) and radiographic studies (Rohini and Kumar, 2017; Patil *et al.*, 2018; Subha and Arvind, 2019) over the past five years. While searching the literature for potentially malignant disorders, it was found that not many studies were present regarding the incidence of potentially malignant disorders. Hence, the aim of this study was to assess the incidence of oral potentially malignant disorders in patients attending a private dental hospital.

## MATERIALS AND METHODS

This study was performed in a university setting. Ethical approval of this study was obtained from the Scientific review board [SRB] of the dental institution in Chennai (SDC/SIHEC/2020/DIASDATA/0619-0320). It was a retrospective study in which 1000 patient records were reviewed. All patients diagnosed with potentially malignant disorders were included in this study, and those patients with PMDs coexisting with other mucosal lesions were excluded. Details such as gender, age, presence or absence of PMD, type of PMD were collected from patient's records. These details were tabulated in excel. Cross verification of data was done with photographs. Data was then transferred to SPSS, and analysis was performed.

## RESULTS AND DISCUSSION

In this study, the incidence of oral, potentially malignant disorders was found to be 1.3%. Kumar et al. reported 13.75% of the Indian population with the presence of oral potentially malignant disorders (Kumar *et al.*, 2015). In the current study, out of 1000 patients, 13 patients had PMD. Sivakumar et al. reported out of 2368 patients, 156 patients with PMD (Sivakumar *et al.*, 2018). The findings from the present study had varied a lot from other studies. This may be due to differences in habit usage and environmental factors.

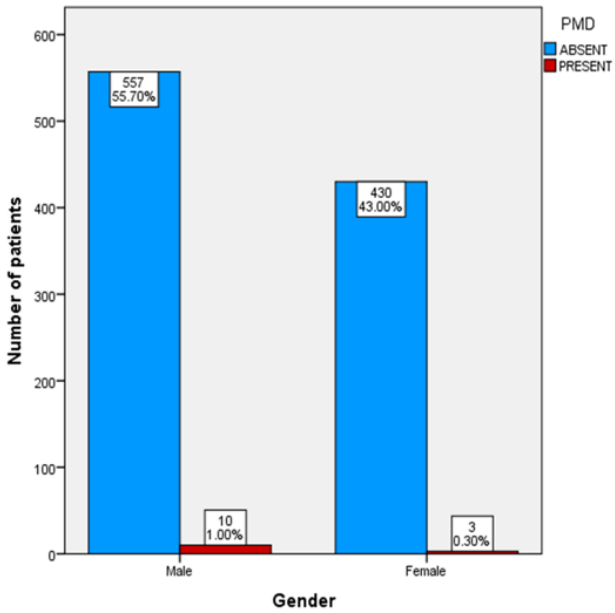


**Figure 1: The association of gender with presence (red bar) and absence (blue bar) of PMDs.**

Out of 1000 patients, only 13 patients had potentially malignant disorders out of which 10(1%) were male, and 3(0.30%) patients were female Figure 1. Chi-square tests were done between gender and PMD. P-value was found to be 0.139, which was found to be not statistically significant. Kumar et al. also reported a significantly higher rate in males (97.1%) than females (2.9%) ($P < 0.001$) (Pentapati *et al.*, 2015).

This study showed male had a higher predilection of PMD than females. Kumar et al. reported

males (17.4%) were found to have a significantly higher predilection of PMD than females (Kumar *et al.*, 2015). Siva Kumar et al. also reported male predilection of PMD (Sivakumar *et al.*, 2018). Manthapuri et al. reported PMD cases with 41 males and 21 females, which also showed a male predilection for PMD (Manthapuri and Sanjeevareddygari, 2018). The male predominance of PMD in this study was similar to the other studies. This can be attributed to the fact that the habit of tobacco consumption is more in males than females.

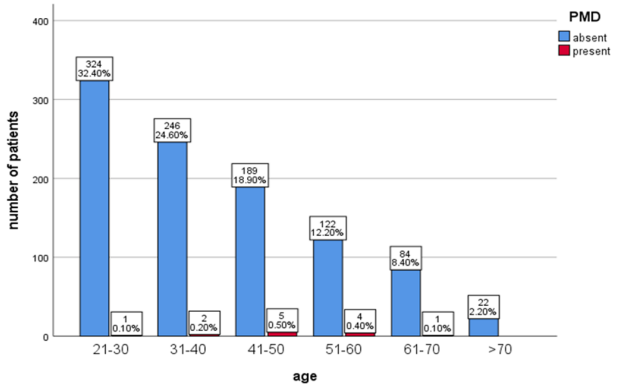


**Figure 2: The association of age groups with presence (red bar) and absence (blue bar) of PMDs.**

1(0.1%) patient with PMD was in 21-30 yrs age group, 2(0.2%%) patients with PMD was in 31-40 yrs age group, 5(0.5%) patients with PMD was in 41-50 yrs age group, 4(0.4%) patients with PMD was in 51-60 yrs age group, 1(0.1%) patient with PMD was in 61-70 yrs age group, none of the patients with PMD was in >70yrs age group Figure 2.

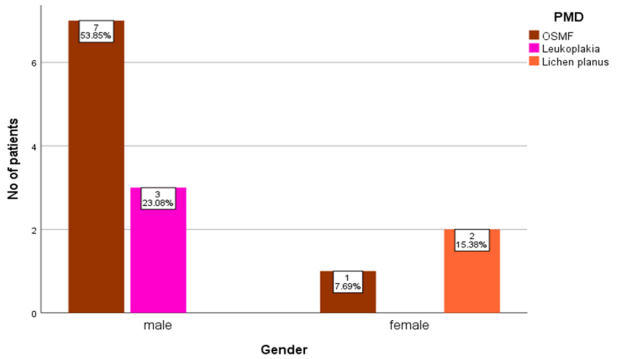


**Figure 3: The association of gender of patients with different PMDs like OSMF (brown bar), leukoplakia (pink bar) and lichen planus (orange bar).**

Chi-square tests were done between age groups and PMD. P-value was found to be 0.102, which was found to be not statistically significant. Kumar et al. also reported no significant difference was seen between age and prevalence of PMD ($P$ = 0.367) (Pentapati *et al.*, 2015). This study showed 41-50 yrs of patients had higher predilection of PMD followed by 51-60 yrs and least in 21-30 yrs and 61-70 yrs and no PMD in the age group of >70 yrs. Manthapuri et al. reported 25 to 55 yrs as the most common age with PMD (Manthapuri and Sanjeevareddygari, 2018). This is almost similar to the current study. This can be due to the prolonged use of tobacco products for many years, which led to the development of PMD in these patients. Out of 13 patients with PMD, 7(53.85%) male patients, 1(7.69%) female patient had OSMF, 3(23.08%) male patients, none of the female patients had leukoplakia, 2(15.36%) female patients, none of the male patients had lichen planus, and none of the patients had erythroleukoplakia Figure 3. Chi-square tests were done between gender and various PMD. P-value was found to be 0.018, which was found to be statistically significant. Kumar et al. reported gender wise difference found to be statistically highly significant (Kumar *et al.*, 2017).

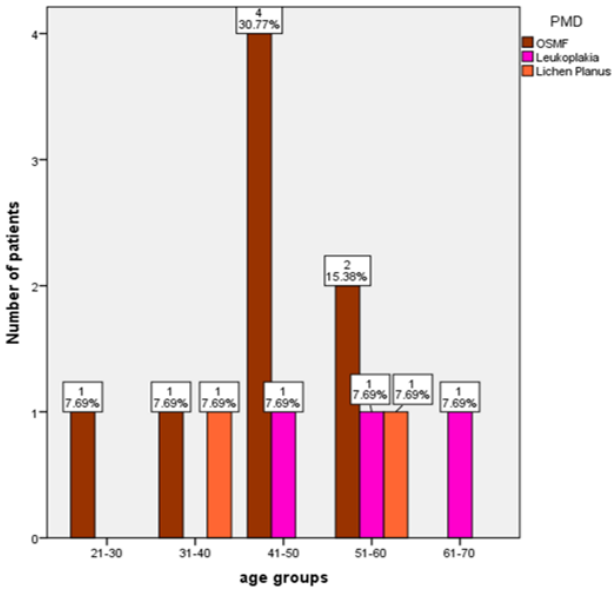


**Figure 4: The association of age groups of patients with types of PMDs like OSMF (brown bar), leukoplakia (pink bar) and lichen planus (orange bar).**

4(30.77%) patients in 41-50yrs, 2(15.38%) patients in 51-60yrs, 1(7.69%) patient in 21-30yrs and 31-40yrs had OSMF. 1(7.69%) patient in 41-50yrs, 51-60 yrs, 61-70 yrs had Leukoplakia. 1(7.69%) patient in 31-40yrs, 51-60 yrs had Lichen planusFigure 4. Chi-square tests were done between age groups and various PMD. P-value was found to be 0.492, which was found to be not statistically significant. Kumar et al. reported OSMF with significant positive association and leukoplakia, erythroplakia with no significant positive association with advancing age (Kumar

*et al.*, 2017). This study shows that 41-50 yrs of patients had a higher predilection for OSMF, 41-50 yrs, 51-60yrs, 61-70yrs of patients had a predilection for Leukoplakia and 31-40yrs, 51-60yrs had a predilection for lichen planus.

This study showed OSMF was the most prevalent PMD, followed by leukoplakia and Lichen planus (15%) was the least prevalent, and none of the patients had erythroleukoplakia. Kumar et al. reported OSMF as the most prevalent PMD and erythroleukoplakia as least prevalent (Kumar *et al.*, 2015). Sivakumar et al. reported leukoplakia as the most prevalent PMD and lichen planus as the least prevalent (Sivakumar *et al.*, 2018). The finding by Sivakumar et al. is in contrast with the current study, which may be due to habitual differences between the study groups.

The findings from the present study add to the consensus of previous studies done by other authors. However, there were few studies that contradicted the findings of the present study because of certain differences such as study population, habit usage related differences etc. Limitations of this study include small sample size, and since it is a retrospective study, the clinical description of the lesion and the diagnosis is dependent on the diagnostic skills of the individual doctor who filled the patient records which might have errors. Future studies can be done with larger sample size, as a multicentric study with details on habit history and can be made as prospective study design.

## CONCLUSION

The current study showed the incidence of the potentially malignant disorder and among the population studied OSMF was found to be high among various potentially malignant disorders. This can be attributed to areca nut chewing habits which are high in Southeast Asia. More awareness programmes on the detrimental effects of tobacco & areca nut are necessary for effective prevention of potentially malignant disorder.

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The authors declare that they have no funding support for this study.

### Conflict of Interest

The authors declare that they have no conflict of interest for this study.

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