

Oral Mucosal Lesions in Kelantanese Sub-population: A One-Year Data Review

Rosmaliza Ramli¹, Nurhafizah Ghani¹, Nik Aloesnisa Nik Mohd Alwi¹, Tng Nur Kamaliah Tng Mohd Salleh², Tham Yuen Wern³, Masitah Hayati Harun⁴

¹ Basic Sciences and Oral Biology Unit, School of Dental Sciences, Universiti Sains Malaysia, Health Campus

² Paediatric Dentistry Specialist Clinic, Tawau Hospital

³ Oral Maxillofacial Department, Duchess of Kent Hospital

⁴ Oral Medicine and Oral Pathology Unit, School of Dental Sciences, Universiti Sains Malaysia, Health Campus

niknisa@usm.my

Abstract

Mucosal lesions of the oral cavity are common findings at dental clinic worldwide. Regardless of the severity and diagnosis, oral mucosal lesions (OMLs) affect an individual's general health, as the oral cavity serves as the main route for nutrients intake that is crucial for human survival. Data on the prevalence and distribution of OMLs is imperative to aid in the diagnosis and management of OMLs. The aim of the present study was to determine the distribution of OMLs amongst patients attending dental clinic, Hospital Universiti Sains Malaysia (HUSM). A cross-sectional study using secondary data was conducted. Dental records of patients receiving oral examination and treatment in dental clinic from January to December 2014 were obtained. Data were analysed using Chi-square test. Throughout 2014, 43 records of patients presented with OMLs were obtained. The most common lesion was ulcerative lesions (37.3%), followed by oral lichen planus (27.4%). Patients with exophytic lesions contributed 15.7%, while candida-related lesion and keratotic lesion contributed 11.8% and 7.8% respectively. Except for keratotic lesion, which was significantly associated with smoking, none other OMLs were associated with any of the risk habits (smoking, betel quid chewing or alcohol consumption). Data from this study serve as a basis for OMLs epidemiology studies on larger scale that will further aid in the detection, diagnosis and better management of the oral lesions. Findings from this study further emphasize the importance of quit-smoking program to reduce the risk of developing oral keratotic lesion, among other diseases that have been associated with smoking habit.

Keywords: Oral mucosal lesions, ulcerative lesions, dental patient, high risk habits, smoking

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Introduction

Oral cavity is the window to the digestive system. Any lesion presents in the oral cavity interferes with the oral intake of an individual, affecting their general wellbeing and health. Early detection of OMLs provides better management and prognosis of the conditions. In this regard, prevalence studies serve as an important tool that guides clinicians to detecting and diagnosing OMLs.

The prevalence of oral mucosal lesions (OMLs) differs across the globe which ranges from 27% - 84%¹⁻⁴. This high variability could be due to the difference in sociodemographic background of the population between countries, and the methodology employed in different studies⁵. Most data on the OMLs prevalence published were from Asian countries⁶; the high prevalence of oral malignancies in this region could have favoured the research within this niche⁷.

Oral mucosal lesions are defined as oral mucosa changes based on the colour, surface texture, swelling or breach of the oral mucosa epithelium⁵. Recognition and diagnosis of OMLs require sound clinical knowledge and experience of the clinician, in assessing the clinical presentation of the lesion, together with the thorough history taking⁸. Although majority of OMLs are benign in nature and do not require active management, some early changes of the oral mucosa may indicate early signs of malignant transformation⁹.

Individuals suffering from OMLs may present with pain, difficulty in eating and speaking, and aesthetic problems. These issues may impose a significant impact on an individual's quality of life^{10, 11}. Thus, a proper guideline on the diagnosis and management of OMLs is very important to provide a better healthcare system for the society.

Data from epidemiological studies are very helpful in the diagnosis and management of OMLs. In Malaysia, the most recent data on epidemiology of OMLs was published in 1997¹². Thus, there is a need for an update on this data for better management of OMLs cases for the local population.

This study focused on the distribution of different types of OMLs among patients attending dental clinic Hospital Universiti Sains Malaysia (HUSM) from January 2014 to December 2014, not limited to gender, age and race. This study provides data on the general OMLs' distribution in Hospital USM that may serve as a baseline not only for the management of OMLs but also for future studies in the related field.

Materials and methods

Sampling Method

This is a cross-sectional study on secondary data of OML patients who attended dental clinic, HUSM from January 2014 to December 2014. The ethical approval was obtained from the Human Research Ethics Committee USM (HREC) (USM/JEPeM/15060192).

Data Retrieval and Collection

All patients presented with OMLs and had a clear/complete data recording were included in this study. Records of patients who did not complain or did not present with OMLs and attended clinics in Hospital USM other than dental clinic were excluded from the study. Dental records of patients within the study period was examined and recorded by two undergraduate students and evaluated by an Oral Pathology and Oral Medicine (OMOP) specialist. From these subjects, those patients presented with OMLs were identified. Data on sociodemographic characteristics, practice of risk habits and clinical presentation of OMLs were recorded and collected.

Criteria for OMLs

Diagnosis of OMLs were made and confirmed by OMOP specialist according to the guidelines from WHO¹³.

Data Analysis

Data were analysed using Statistical Package for Social Science (SPSS) version 26.0 (SPSS Inc. Chicago, IL, USA). Analysis for the association between gender with ulcerative lesions and oral lichen planus were performed using Pearson chi square test. The association of all other OML categories with the demographic data were analysed using Fisher's exact test.

Similarly, except for the association between ulcerative lesions with smoking, which was analysed using Pearson chi square test, the association of all risk habits (smoking, betel quid chewing and alcohol consumption) with other OML categories were analysed using Fisher's exact test. The level of significance was set at $p < 0.05$.

Results

A total of 43 records of patients diagnosed with different type of OMLs were retrieved in this study. Majority of the patients were female (58.1%) and almost all patients were Malay (95.3%). Two of the patients were Chinese and we found none from other ethnicities.

We categorised the age of the patients into six categories: 1) 20 yrs, 2) 20-29 yrs, 3) 30-39 yrs, 4) 40-49 yrs, 5) 50-59 yrs and 6) 60-69 yrs. Most patients were in category 60 yrs (32.6%) while the lowest number of patients were in category <20 yrs (7%). The summary for demographic characteristics is summarised in Table 1.

* $P < 0.05$

Table 1
Demographic characteristics of oral mucosal lesion patients

	Number and % within patients with oral lesions [n (%)]
Gender	
Male	18 (41.9%)
Female	25 (58.1%)
Age (years)	
< 20	3 (7%)
20-29	4 (9.3%)
30-39	6 (14%)
40-49	6 (14%)
50-59	10 (23.3%)
>60	14 (32.6%)
Ethnicity	
Malay	41 (95.3%)
Chinese	2 (4.7%)
Indian	0
Others	0

In this study, OMLs were categorised into oral lichen planus, candida-related, ulcerative, exophytic, and keratotic lesions. The most frequent oral lesions found were ulcerative lesions (37.3%) followed by oral lichen planus (27.4%). Candida-related lesions which include median rhomboid glossitis comprised 11.8%, while exophytic lesions contributed 15.7% from all lesions found. The least number of lesions found were keratotic lesions (7.8%).

Most of these lesions occurred in patients of older age. Mean age for candida-related, ulcerative, exophytic, keratotic lesions and oral lichen planus were 61.2±18.98, 36.5±14.84, 48.6±19.57, 60.5±19.11 and 54.6±19.58, respectively. With regard to gender preference, there was an equal male to female ratio for candida-related and exophytic lesions. Females predominated over male for ulcerative lesions and oral lichen planus with male to female ratio 7:12 and 2:5, respectively.

Meanwhile, males were affected more than females for keratotic lesions with the male to female ratio 3:1 (Table 2).

Table 2
Distribution of 51 oral mucosal lesions detected in 43 patients

Type of OMLs	No of lesion [n (%)]	Mean Age ± SD (years)	Male to female ratio
Candida-related lesions	6 (11.8%)	61.2±18.98	1:1
Ulcerative lesions	19 (37.3%)	36.5±14.84	7:12
Exophytic lesions	8 (15.7%)	48.6±19.57	1:1
Keratotic lesions	4 (7.8%)	60.5±19.11	3:1
Oral lichen planus	14 (27.4)	54.6±19.58	2:5

The anatomical sites for OMLs vary according to the different OML categories. Oral lichen planus and ulcerative lesions were found mostly on the buccal mucosa (11 out of 23 and 9 out of 31 cases, respectively).

Meanwhile, candida-related lesions were found mostly on the palate (3 out of 12 cases), keratotic lesions on the tongue (2 out of 7 cases) and exophytic lesions on the gingiva (3 out of 9 cases) (Figure 1).

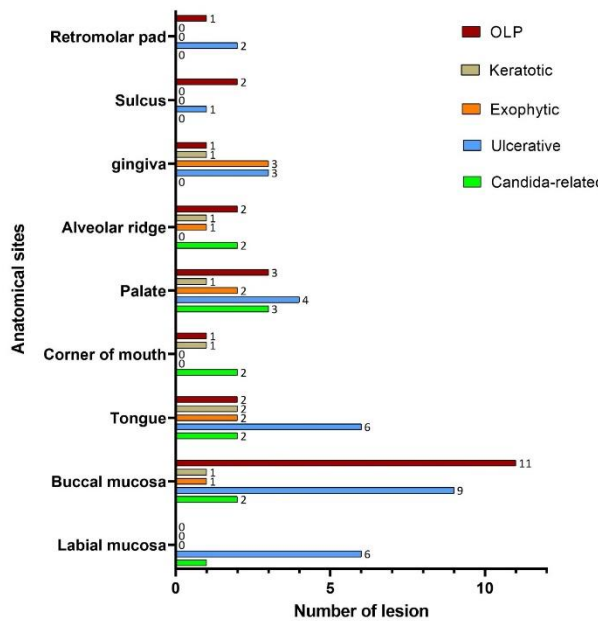


Figure 1: Distribution of oral mucosal lesions at different anatomical sites.

In particular, we found one case of herpetic lesion (which was categorised under ulcerative lesions) on the tongue of a six-month old Malay patient and another case of rhomboid median glossitis on the tongue of a 50-year old Malay male patient.

The associations between different categories of OMLs with age, gender and ethnicity were presented in Table 3. We found only a significant association between age and ulcerative lesions ($P < 0.05$). Other OMLs showed no significant association with any of the sociodemographic data (age, gender and ethnicity).

Oral mucosal lesions	Age		Gender		Ethnicity	
	χ^2 Statistic (df)	p value	χ^2 Statistic (df)	p value	χ^2 Statistic (df)	p value
Candida-related lesions	-	0.580	-	0.680	-	1.000
Ulcerative lesions	-	0.022*	0.235 ^a (1)	0.771	-	1.000
Exophytic lesions	-	0.611	-	0.702	-	1.000
Keratotic lesions	-	0.870	-	0.293	-	1.000
Oral lichen planus	-	0.631	0.060 ^a (1)	1.000	-	1.000

We further studied the smoking habit, betel quid chewing and alcohol consumption in patients according to the different OML categories.

Smoking was most frequently seen in patients diagnosed with keratotic lesions, while none of the patients diagnosed with candida-related and exophytic lesions were active smokers. Only one patient diagnosed with ulcerative lesion and another patient with oral lichen planus claimed to be active smokers.

We also assessed betel quid chewing and alcohol consumption; for both habits, 31 (72.1%) patients claimed to never chew betel quid or drink alcohol while 12 (27.9%) of them with unknown status of any of the habits. Analysis of the association between different categories of OMLs with risk habits showed a significant association between keratotic lesions with smoking habit ($P < 0.05$). All other lesion categories were not significantly associated with any of the risk habits studied (Table 4).

Table 4
Association of oral mucosal lesions with risk habits (smoking, betel quid chewing and alcohol consumption).

^a Pearson chi square

* $P < 0.05$

Oral mucosal lesions	Smoking		Betel quid chewing		Alcohol consumption	
	χ^2 Statistic (df)	p value	χ^2 Statistic (df)	p value	χ^2 Statistic (df)	p value
Candida-related	-	0.503	-	0.327	-	0.327
Ulcerative	-	0.653	2.068 ^a	0.202	0.068 ^a	0.202
Exophytic	-	0.435	-	1.000	-	1.000
Keratotic	-	0.020*	-	1.000	-	1.000
Oral lichen planus	-	0.247	-	0.525	-	0.525

Discussion

There are increasing concerns on the OMLs among the community and health experts, due to its effects on the quality of life and more importantly its potential to develop into malignancies. Epidemiological studies on OMLs could provide the basis of the extent and seriousness of any of these lesions, serving as an important tool for a more comprehensive OMLs management. OMLs should be one of the highlights in oral health studies, in addition to the already popular subjects, dental caries and periodontal diseases¹⁴.

The multi-ethnicity population in Malaysia makes it a diverse and unique country. The major ethnic groups are Bumiputras [whom are Malays, and other indigenous people of Sabah and Sarawak (62.1%)], Chinese (29.4%), Indians (8.1%), and others (0.5%)¹². However, according to census data issued every 10 years, Kelantan (where this study was conducted) was heavily populated by Malays (93.8% from the overall population)¹⁵. This ethnicity distribution was reflected in our study where the vast majority of our patients were Malays. Study by Zain *et al.* (1997) reported that the prevalence of OMLs was highest among Indians (4.0%) followed by Bumiputras (the indigenous people of Sabah and Sarawak) (2.5%) whilst the lowest prevalence was contributed by the Chinese (0.5%). However, results from the present study found no association between ethnicity and OMLs. The large sample size (1135 OML patients) and wider population coverage in Zain *et al.* (1997) study compared to ours could be the crucial factor that contribute to this unparallel results.

In the present study, we found variations in gender preference in the distribution of different types of OMLs. In particular, ulcerative lesions were higher in females compared to males. Our results are in agreement with data from Malaysia National Survey 1997 which reported similar distribution of OMLs between males and females¹². However, studies in other countries showed different gender distribution of OMLs. In Saudi Arabia, OMLs are more commonly found in females¹⁶ while other studies conducted in Mexico, India, and South Africa in 2008, 2013, and 2020, respectively reported that OMLs were more commonly found in males than females^{1, 14, 17}. The higher prevalence of OMLs in males could be attributed to the lifestyle and habits in these regions; males are more known to consume tobacco and other addictive substances compared to females^{18, 19}. Tobacco and other addictive substances have been shown to have a significant association to some of the OMLs such as leukoplakia and oral submucous fibrosis^{1, 3, 16, 17}.

The age distribution of OMLs in this study showed some similarities with the findings from the earlier Malaysian National Survey 1997¹². Their data showed that high prevalence of OMLs were found both in the middle age group (45 – 64 years, 28.26%) and older age group (65 years or more, 28.35%) while the younger age group had a lower prevalence compared to the other two groups (25 – 44 years, 13.73%). In the present study, subjects in older groups (>60 years old) had the highest prevalence (32.6%), followed by those aged 50-59 years old (23.3%), while subjects from younger age group (<50 years) contributed only less than half of that from those >50 years old (44.3%). Improved healthcare services and health awareness in Malaysia over the past two decades have led to increased number and proportion of elderly population

in Malaysia (defined as individual aged 60 and above)²⁰⁻²². However, despite having the benefit of living a longer life, the elderly people are also known to be susceptible to most diseases compared to other age groups which could be one of the crucial factors that lead to high OMLs in patient >60 years old.

In addition, the increase number of both medical doctor and dentist has also provided better disease detection and diagnosis hence the increase OMLs in elderly and overall population. Data from Department of Statistics Malaysia showed that the ratio of medical doctor and dentist to patient have decreased over the years; dentist to patient ratio in particular, has reduced from 1:6 to 1:4 from 2012 to 2016²³. On the other hand, population of the younger generations (<60 years) are declining as a result of low birth rate and declining total fertility rate in Malaysian population^{21, 22}. Together with the increase health awareness among Malaysians, this in turn could contribute to the lower cases of OMLs in younger groups in our study.

In this study, OMLs were diagnosed according to a guideline by WHO: Guide to Epidemiology and Diagnosis of Oral Mucosal Diseases and Conditions²⁴. Our data showed that the most common type of OMLs in patients attending dental clinic Hospital USM was ulcerative lesions, of which none of these were malignant. Findings from most studies across the globe showed that malignant lesions represent only a minority among all lesions in the oral mucosa^{1, 2, 12, 14}. Due to this worldwide low prevalence of intraoral malignant lesions together with our small sample size, it is not surprising that we did not find any malignant lesion among the 43 records retrieved in our study. Despite none of our ulcerative lesions was diagnosed malignant, close observation and monitoring should be performed to patients presented with oral ulcer. Ulcerative lesion has been shown to be one of the common presentations for the most prevalent oral malignancy, the oral squamous cell carcinoma (OSCC)²⁵⁻²⁸. Most OSCC cases presented to dental clinic and diagnosed as malignancy when they are already at an advanced stage of disease progression which contribute to poor prognosis for survival^{29, 30}. Thus, it is crucial for any patients presented with oral ulcer to undergo a thorough clinical examination regardless of the age; as individuals from different age groups could suffer from OSCC³¹. One herpetic lesion was found on the labial mucosa of a six-months old baby, consistent with other studies which reported several lesions such as herpetic infections are more frequently seen in children than adult³²⁻³⁴.

A variety of OMLs are associated with the risk habits such as tobacco smoking and betel quid chewing, and many of these carry a potential risk for the development of cancer³⁵. A cross sectional study conducted in South India revealed that the prevalence of OMLs in patients with tobacco smoking, chewing and mixed habits was higher compared to those patients without such habits (26.8% vs 2.8% respectively)³⁵. In particular, a review on epidemiological and experimental studies have identified smoking as a risk factor for malignancies^{36, 37} including those of the orofacial region^{38, 39}. Smoking has also been associated with oral lesions such as keratosis and OSCC³⁹. Even the use of nicotine replacement therapy (NRT) which is aimed at replacing nicotine in tobacco product for smoking cessation program, can lead to keratotic changes

of the oral mucosa⁴⁰. Tebbut and colleagues reported that the excessive use of oral NRT could lead to nicotine-associated keratosis with hyperplastic changes. Despite the absence of dysplastic or malignant changes, oral keratosis has been shown to share genomic overlap with oral dysplasia⁴¹, thus, should be monitored and observed closely for potential malignancy.

Except for the significant association between keratotic lesion and smoking habit, we found that majority of the subjects diagnosed with OMLs did not smoke tobacco, chew betel quid or drink alcohol. Although our data showed that OMLs in these groups was not associated with any of the high risk habits, it is worth mention that both young and elderly populations are more exposed to different types of stress as the world evolves and progresses. Almeida, Charles, Mogle, Drewelies, Aldwin, Spiro III and Gerstorf⁴² studied stress in subjects between 1990 and 2010 and reported that stressful daily life experience and historical changes had caused increase in number of stressors as the years progressed and that some of the stressors became more severe and posed more risk to their future plans. Recent studies on the association of stress with oral lesions suggested that stress could be one of the aetiologic factors to oral lesions such as oral ulcers and oral lichen planus⁴³⁻⁴⁶. Data on the psychosocial aspect of our subjects were not available from the records retrieved.

Conclusion

The present study provides an overview of demographics of OMLs among dental patients attending dental clinic Hospital USM. These data could serve as a basis for further evaluation of oral health care in Kelantan and Malaysia in a larger scale. Within the limitations of this study, we found that the most common lesion of the oral mucosa of patients attending dental clinic Hospital USM was ulcerative lesions which were commonly found in the middle age group. Among the risk habits studied, smoking habit was significantly associated with keratotic lesions. Together, these data provide, at the very least, an update for the distribution of OMLs amongst Kelantanese which will serve as a basis for future bigger scale studies.

Recommendation

Thus, it is deemed important to consider and include the psychological and psychosocial factors for OMLs future studies. By including this factor, it is hoped that a better and more comprehensive and holistic management of OMLs could be outlined and practiced in Malaysia.

Limitation of Study

Three main issues that may affect the results in this study are worth mention; 1) Data of OMLs were obtained from subjects' records and no direct oral examination was performed on the patients, 2) The duration of the study which was one year, and 3) the study population which reflects the sample size. Thus, it is imperative for future studies to address these main issues to overcome the lack of generalisation and statistical insignificance data from this study.

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