ORIGINAL ARTICLE Open Access

Distribution of cases encountered in Oral Medicine Undergraduate Clinic: A retrospective analysis

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Abstract

Oral Medicine (OM) is a dental specialty concerning the diagnosis and non-surgical management of oral conditions closely related to medical disorders. This study aims to evaluate the distribution of OM cases at the International Islamic University Malaysia (IIUM) undergraduate dental polyclinic and to determine its relationship with sociodemographic background via disease category. Students' OM logbooks across four academic years were used for convenient sampling. Disease categories were based on previously published studies. Total cases were classified into 22 diagnosis codes and analysed using SPSS version 23. A total of 1917 cases were recorded at the undergraduate dental polyclinic across four academic batches, from year 2010 until 2018**.** OM case with highest frequency was oral ulcer (31%), followed by temporomandibular disorder (23%), and pericoronitis (10%). In contrast, the least common cases were lichen planus (0.4%), oral potentially malignant disease (0.3%), and tumour (0.2%). With regards to age group, second decade age group was reported the most across the observation period. OM cases were higher in females across most disease categories and Malays were the highest ethnicity reported. The current study identified the most common OM cases encountered in IIUM undergraduate dental polyclinic. The findings may portray the disease burden in the Kuantan population in general. Knowledge of common cases is crucial to prepare clinicians with safe and competent management required in clinical practice.

Keywords: *disease burden, oral medicine, retrospective*

Received:
29 December 2023
Revised:
17 February 2024
Accepted:
17 February 2024
Published Online:
29 February 2024
How to cite this article:
Ibrahim, N. R., Mohd Ali, M. N. H., Mohd, F. N., Khalil, N., & Sahar, N. H. (2024). Distribution of cases encountered in Oral Medicine Undergraduate Clinic: A retrospective analysis. *IIUM Journal of Orofacial and Health Sciences*, *5*(1), 41–52. https://doi.org/10.31436/ijohs.v5i1.242
Article DOI:
https://doi.org/10.31436/ijohs.v5i1.242
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Introduction

Oral Medicine (OM) is a specialty of dentistry concerning patient oral health and diagnosis. It also involves non-surgical management of conditions affecting the oral and maxillofacial region which are closely related to medical disorders or conditions (AAOM, 2022).

Diagnoses and non-surgical treatments in oral medicine include chronic facial pain, temporomandibular joint disorders (TMDs), salivary gland lesions, oral mucosal lesions and also oral potentially malignant disorders. An oral medicine specialist may advise the dental practitioners on the precautions needed in managing patients with complex medical conditions, patients

who have undergone special therapies and those being treated for cancer.

According to Axell *et al*., (1990), oral and dental health are often mistaken as one entity, and in many situations, the dentition becomes the only priority. This misconception may lead people to belittle the needs of oral health care as a whole. Oral diseases can be presented as pain or discomfort, speech interference and difficulty in swallowing and mastication. Symptoms such as xerostomia, halitosis or oral dysesthesia can disrupt one's daily activities, leading to poorer quality of life (Cebeci *et al*., 2009).

Knowledge of the frequency of disease in a focused population equips oral health care providers with insight into disease patterns in the population (Kelloway *et al*., 2014). Research done on global burden and risk distribution of disease contributes to decision and planning evaluations and their impact on the community (Bhatt *et al*., 2013).

Oral cancers, noma, and oral manifestations of Human Immunodeficiency Virus (HIV) are among the seven major oral diseases and conditions contributing to oral disease burden (WHO 2020). The Global Burden of Disease Study 2016 estimated that at least 3.58 billion people worldwide are affected by oral disease.

Several studies have been reported in literature with regards to disease frequency and prevalence. One example is a prevalence study performed in Turkey (Mumcu G *et al*., 2017). Of the 765 residents participating in the study, 41.7% had oral pathologies: 22.5% had one lesion, 7.6% had two and 4.6% had three or more. The most common oral lesion was excessive melanin pigmentation (6.9%), followed by fissured tongue (5.2%) and denture stomatitis (4.3%). The least common oral lesion was mucocele at only 0.1% occurrence. However, the study reported an almost equal prevalence of oral lesions in both sexes: 42.8% in males and 40.5% in females.

In Malaysia, a study conducted to determine the prevalence of tongue lesions in a dental outpatient clinic in Klang Valley (Koay *et al*., 2011) reported at least one type of tongue lesion diagnosed in 181 patients (30.2%) where16.7% were females and 13.5% were males. 24 of the total patients (4%) had two or more tongue lesions appearing simultaneously. Fissured tongue was ranked as the most prevalent tongue lesion.

Another study on the frequency of oral lesions was carried out in a Saudi population in 2009 (Al-mobeeriek & Aldosari, 2009). A total of 383 (15.0%) patients had oral mucosal lesions, with 42.3% being in males and 57.7% in females. The most affected age group was 31 to 40 years (21.4%), and the least commonly affected group was individuals older than 61 years old. The most common lesion was Fordyce granules (3.8%), followed by leukoedema (3.4%) and traumatic lesions (1.9%).

A survey by Mozafari (2012) in institutionalized elderly people in Iran revealed a higher prevalence of oral mucosal lesions compared with previous studies in other regions of Iran. The difference in frequency may be due to cultural differences, oral habits, level of education, or genetic differences. The author concludes that national programs promoting oral health are necessary to address the increased prevalence of oral lesion in the population. Thus, dentists and oral medicine specialists need to incorporate regular checkups into geriatric oral health care service (Mozafari *et al*., 2012).

The distribution of various diseases encountered in the International Islamic University Malaysia (IIUM) dental polyclinic has not been explored before; the exact nature of disease distribution in the Kuantan population, particularly those attending the IIUM dental polyclinic has not been scientifically evidenced. It is necessary for clinicians to equip themselves with knowledge of disease burden to equip themselves to provide accurate treatment to patients. Therefore, this study aimed to evaluate the distribution and sociodemographic data of OM cases

encountered in the IIUM undergraduate dental polyclinic.

Materials and Methods

Study design and participants

This study was a nine-year retrospective study performed on patients attending the IIUM undergraduates dental polyclinic in Kuantan. Archived data from four batches of IIUM dental undergraduates' OM logbooks and patients' case notes were used in this study.

Records of all the cases seen in OM undergraduate dental clinic were extracted from 2010-2018 using convenience sampling. The extracted records contained demographic and clinical data such as age, gender, ethnicity, diagnosis, and year of diagnosis. Prior to data collection, ethical approval from IIUM Research Ethics Committee was obtained (ID No: IREC 2019-046).

Case selection

The inclusion criteria for the study were OM cases presented and approved by OM specialists and well recorded in the logbook. Cases that did not have supervisor's approval in the logbook were excluded. Where only partial information was extracted from students' OM logbooks, patients' folders were retrieved from the record-keeping room.
OM cases were defined based on the year of diagnosis. The categorization of diagnosis is further elaborated in Figure 1.

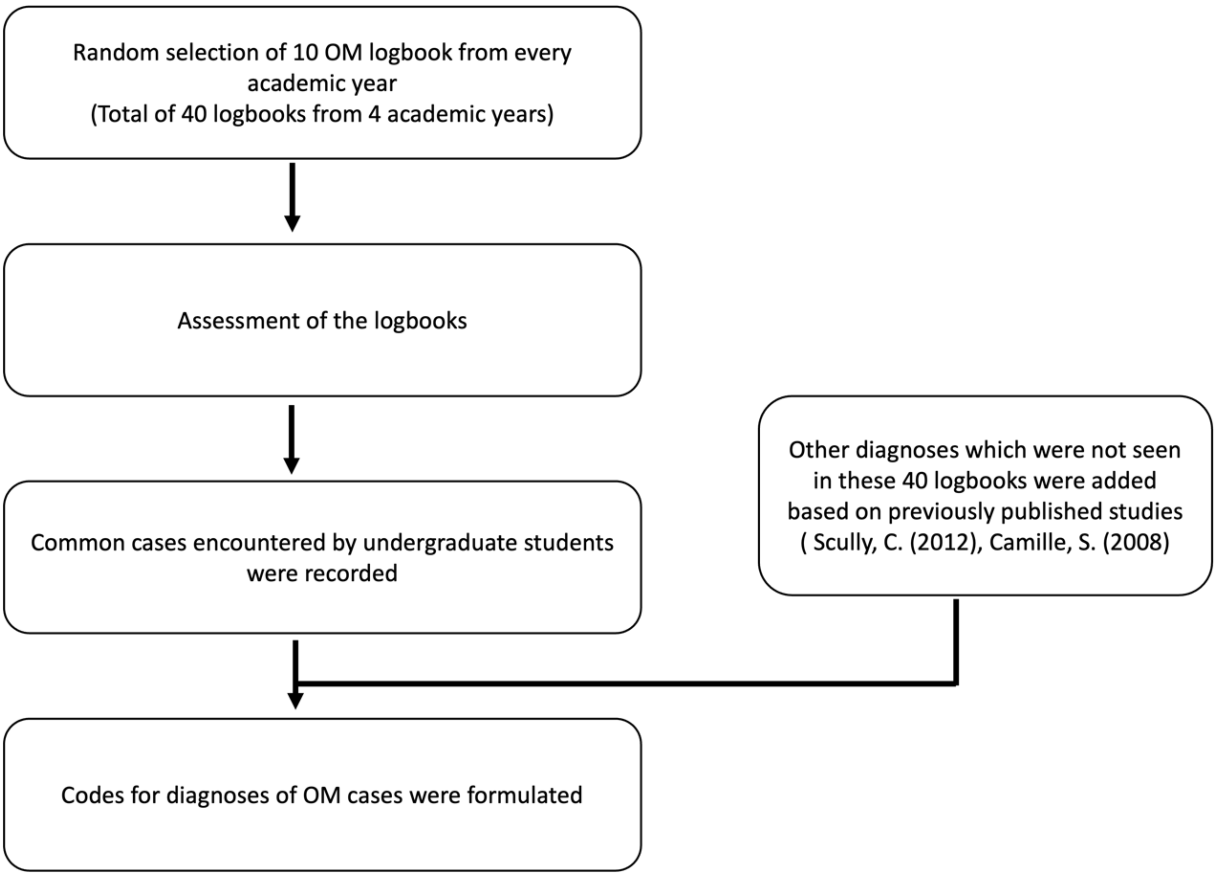

Figure 1. Process for determining diagnosis category.

Data analysis

Data was collected and processed using SPSS software (IBM Corp. Released 2015. Version 23.0. Armonk, NY: IBM Corp.). Categorical variables were analyzed as frequencies and percentages.Result and Discussion

Results

A total of 1917 cases were recorded at the IIUM undergraduate dental polyclinic across four academic years over a duration of 9 years (Table 1).

Figure 2 demonstrates the number of cases diagnosed based on year. The highest number of reported cases was recorded in 2016 and the lowest in 2010.

Table 2 shows the distribution of OM cases and their percentages. During the observation period, 22 diagnoses were recorded. The most frequent OM case encountered at the IIUM undergraduate dental polyclinic was oral ulcer, which contributed to 30.9% of the total cases. OM cases with the lowest frequencies were tumours or neoplasms, oral potentially malignant diseases, and lichen planus or lichenoid reactions, making up four, six, and eight cases, respectively.

The distribution of OM cases according to age group is presented in Table 3. Diagnosis was highest in the second decade group, except for denture stomatitis, soft tissue hyperplasia, and keratosis, which were highest in patients older than 50.

Regarding gender distribution, clear differences in the frequency of oral ulcer and pericoronitis were observed between males and females (Table 4). Females were diagnosed at higher than half of the total disease frequency when compared to male subjects. On the other hand, males more frequently reported keratosis, candidiasis, and teeth anomaly.

Table 5 shows the distribution of cases according to ethnicity. The Malay population had the highest number of cases across majority of the diagnoses. Chinese and Indian ethnicities were also represented, however, their numbers were relatively lower.

Table 1. Number of oral medicine cases according to academic batch.

Academic batch	Number of oral medicine cases
2013/14	408
2015/16	445
2016/17	538
2017/18	526
Total	**1917**

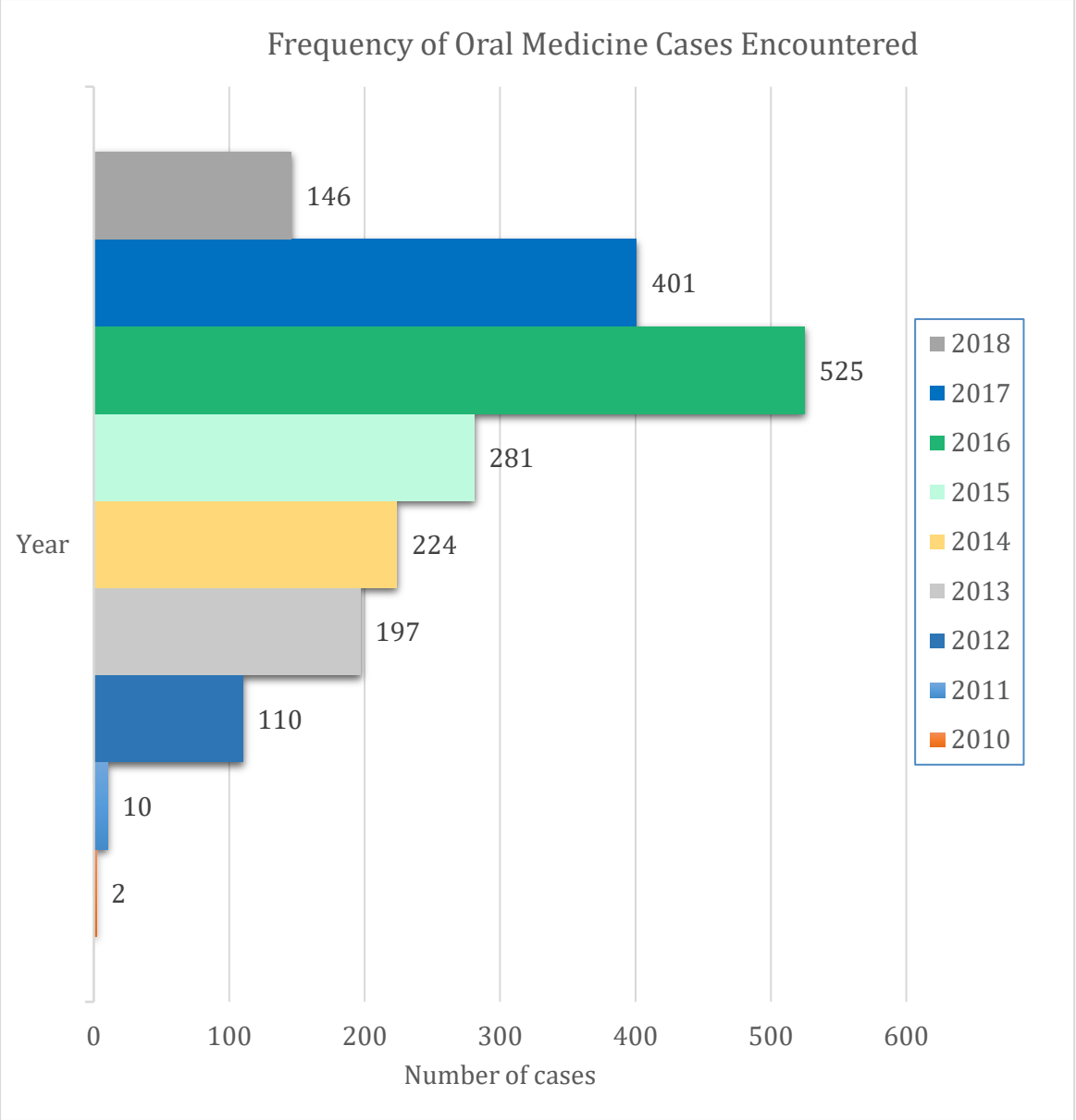

Figure 2. Frequency of oral medicine cases according to year.

Table 2. Distribution of OM cases and their percentages.

Oral diagnoses	Frequency (n)	Percentage (%)
Ulcer	593	30.9
TMD	450	23.5
Mucocele/ Salivary gland disease	41	2.1
Denture stomatitis	83	4.3
Pericoronitis	193	10.1
Candidiasis	19	1
Trigeminal Neuralgia/ Neuropathy	24	1.3
Soft tissue hyperplasia	73	3.8
Keratosis	73	3.8
Pigmented lesion	45	2.3
Lichen planus/ lichenoid reaction	8	0.4
Odontogenic infection/cyst	36	1.9
Angular cheilitis/ cheilitis	41	2.1
Bone lesion	22	1.1
Tumor/ neoplasms	4	0.2
Dry socket	11	0.6
Viral infection	17	0.9
Geographic tongue	46	2.4
Nicotinic stomatitis	10	0.5
Teeth anomaly	21	1.1
Others	101	5.3
OPMD	6	0.3
Total	**1917**	**100**

TMD = Temporomandibular disorder, OPMD = Oral potentially malignant disease

Table 3. Distribution of OM case according to age group.

Diagnosis	Age group						Total
	<21	21-30	31-40	41-50	51-60	>60	
Ulcer	27	232	22	16	25	16	**338**
TMD	35	155	28	21	11	5	**255**
Mucocele/ Salivary gland disease	5	13	2	2	3	3	**28**
Denture stomatitis	0	2	3	6	19	19	**49**
Pericoronitis	16	88	4	0	0	0	**108**
Candidiasis	1	7	0	3	2	3	**16**
Trigeminal Neuralgia/ Neuropathy	1	9	3	3	0	1	**17**
Soft tissue hyperplasia	2	10	4	8	11	7	**42**
Keratosis	1	7	7	9	12	6	**42**
Pigmented lesion	0	14	4	3	4	5	**30**
Lichen planus/ lichenoid reaction	0	0	0	0	1	0	**1**
Odontogenic infection/cyst	1	11	4	5	5	2	**28**
Angular cheilitis/ cheilitis	2	12	0	2	8	2	**26**
Bone lesion	0	7	1	4	2	3	**17**
Tumor/ neoplasms	1	0	1	1	0	1	**4**
Dry socket	2	3	3	0	1	1	**10**
Viral infection	3	7	0	1	1	0	**12**
Geographic tongue	3	11	2	5	3	5	**29**
Nicotinic stomatitis	0	0	0	2	2	2	**6**
Teeth anomaly	3	8	0	1	0	0	**12**
Others	5	26	8	3	10	8	**60**
OPMD	0	1	0	1	1	1	**4**
Total	**108**	**623**	**96**	**96**	**121**	**90**	**1134**

TMD = Temporomandibular disorder, OPMD = Oral potentially malignant disease

Table 4. Distribution of OM cases according to gender.

Oral diagnosis	Gender		Total
	Male	Female	
Ulcer	142	232	**374**
TMD	94	184	**278**
Mucocele/ Salivary gland disease	11	17	**28**
Denture stomatitis	20	34	**54**
Periocoronitis	33	86	**119**
Candidiasis	12	4	**16**
Trigeminal Neuralgia/ Neuropathy	7	11	**18**
Soft tissue hyperplasia	13	35	**48**
Keratosis	34	9	**43**
Pigmented lesion	13	18	**31**
Lichen planus/ lichenoid reaction	1	1	**2**
Odontogenic infection/cyst	14	16	**30**
Angular chelitis/ cheilitis	11	16	**27**
Bone lesion	9	8	**17**
Tumor/ neoplasms	4	0	**4**
Dry socket	5	5	**10**
Viral infection	5	8	**13**
Geographic tongue	15	16	**31**
Nicotinic stomatitis	6	0	**6**
Teeth anomaly	9	3	**12**
Others	31	34	**65**
OPMD	5	0	**5**
Total	**494**	**737**	**1231**

TMD = Temporomandibular disorder, OPMD = Oral potentially malignant disease

Table 5. Frequency of OM cases according to ethnicity.

Oral diagnosis	Ethnicity				Total
	Malay	Chinese	Indian	Others	
Ulcer	338	10	0	3	**351**
TMD	237	15	4	4	**260**
Mucocele/ Salivary gland disease	22	3	0	1	**26**
Denture stomatitis	34	17	0	1	**52**
Pericoronitis	114	0	0	2	**116**
Candidiasis	14	1	0	0	**15**
Trigeminal Neuralgia/ Neuropathy	14	0	2	1	**17**
Soft tissue hyperplasia	37	1	2	1	**41**
Keratosis	34	5	0	1	**40**
Pigmented lesion	28	0	1	1	**30**
Lichen planus/ lichenoid reaction	1	0	0	0	**1**
Odontogenic infection/cyst	25	1	0	0	**26**
Angular chelitis/ cheilitis	21	5	0	1	**27**
Bone lesion	16	0	0	0	**16**
Tumor/ neoplasms	4	0	0	0	**4**
Dry socket	10	0	0	0	**10**
Viral infection	12	1	0	0	**13**
Geographic tongue	26	2	0	0	**28**
Nicotinic stomatitis	6	0	0	0	**6**
Teeth anomaly	9	1	0	2	**12**
Others	54	8	0	1	**63**
OPMD	5	0	0	0	**5**
Total	**1061**	**70**	**9**	**19**	**1159**

Discussion

The current study successfully reports OM cases commonly observed in the IIUM undergraduate dental polyclinic. The diagnoses indicate common oral diseases present in the Kuantan population.

Oral ulcer was the most prevalent OM lesion reported in patients attending the IIUM undergraduate dental polyclinic across the years studied (30.9%). A previous study on the distribution of oral lesions in Turkey by Mumcu *et al*. reported a 1.2% prevalence of recurrent aphthous stomatitis. The difference in observation can be attributed to convenient sampling data collection method used on subjects who have or are visiting the clinic to receive treatment for oral ulcer used in this study, while Mumcu *et al*. used cluster sampling method whereby the oral ulcer subjects were taken from areas screened by the researcher.

In the current study, 60% of subjects (737 out of 1231) attending the IIUM undergraduate dental polyclinic were female. The high percentage of female subjects suggests that oral diseases are more likely in the female population, or that females were more conscious of their oral health than males (Farah *et al*., 2008).

The female to male ratio distribution of oral ulcer cases in this study was 1.6:1. A similar figure was reported by Cebeci in the Turkish population, where the ratio is 2:1(3). Oral ulcer is more prevalent in females and may be associated with changing levels of sex hormones i.e. progesterone and estrogen. A study by Balan et al., reported that 30% of 40 healthy young woman with normal menstrual cycles complained of aphthous ulcer among other oral discomforts (Balan *et al*., 2012).

Oral ulcers were most prevalent in young adults between the ages of 21 to 30 years old when compared to other age groups. This finding is in agreement with a previous study reporting highest prevalence of oral ulcers in age group 25 to 34 years old (Cebeci *et al*., 2009). This may be due to increased work stress leading to anxiety and depression in this age group (Melchior *et al*., 2007). Higher anxiety levels is a proven risk factor for recurrent aphthous ulcers (Al-Omiri *et al*., 2012).

The second highest OM diagnosis recorded was temporomandibular joint dysfunction (TMD), with 540 cases reported over the nine- year duration. Subjects who complained of pain/discomfort and dysfunction of the temporomandibular joint area and adjacent muscle that may also involve pain radiating to ear, throat, and neck region are common symptoms present with temporomandibular joint dysfunction. The aetiology of TMD is broad and can be categorized into biomedical, psychosocial, and biopsychosocial concepts (Suvinen *et al*., 2005).

The ratio of females to males affected with TMD recorded in this study is 2:1 and was highest in the 21–30-year-old age group. This data is corroborated by results from a previous study reporting pain and discomfort of temporomandibular joint and musculature in a distinct number of women of reproductive age (Lövgren *et al*., 2016). Women of this age group are mainly affected due to fluctuating sex hormones and psychological depression *(Giannakopoulos et al*., 2010).

Pericoronitis was the third highest OM case diagnosed with 193 out of 1917 diagnoses made in this study. Pericoronitis is a condition commonly involving the mandibular third molar, where periodontal tissue surrounding an impacted or partially erupted tooth is inflamed as a result of plaque accumulation (Hazza'a *et al*., 2009). Among the total pericoronitis cases, females (72%), and those in the 21-30 age group showed the highest diagnosis frequency. This finding is in agreement with a previous study reporting a high prevalence of pericoronitis among females between 19-23 years old. The study further relates the occurrence of pericoronitis in response to the menstrual cycle, pregnancy and also the period revolving the eruption of the mandibular third molar (Ayanbadejo *et al*., 2007).

The current study recorded 34 keratosis cases in males, and only nine in females. Similarly, other studies carried out in Turkey, Thailand and Malaysia reported higher incidences of keratosis in males compared to females. In Turkey, the male to female case distribution reported for keratosis was 18:11, in Thailand, 7:2, and in Malaysia was 7:5 cases. The high number in males suggests that keratosis is highly associated with tobacco as a predisposing factor.

Similarly, the incidence of nicotinic stomatitis is higher in males than females due to tobacco consumption being an aetiology for this oral lesion, and male smokers outnumbering females. In the present study, six males were reported with nicotinic stomatitis, compared to no females reported. In a previous study by Cebeci *et al*., (2009), seven cases of nicotinic stomatitis was reported in males, and two in females.
Only six cases of oral potential malignant disorder (OPMD) were recorded in the current study (0.3%), while in the Chiang Mai and Kuala Lumpur population, 3.0% and 3.4% prevalence was reported, respectively. OPMD cases include leukoplakia, erythroplakia and oral submucous fibrosis.

On the other hand, the OM cases with lowest frequency were tumour/neoplasms, OPMD, and lichen planus/lichenoid reaction with 0.2%, 0.3%, and 0.4% prevalence respectively. The results show lower distribution of oral lesions when compared to data from other studies. For example, Mumcu *et al.* reported a 0.5% prevalence of lichen planus in the Turkish population. Another study reported a link between tobacco habits and the prevalence of lichen planus in dental school out-patients in Malaysia and Thailand at 3.8% and 2.1%, respectively. In the current study, the subjects' habits were not recorded; therefore, a link between tobacco habits and oral lesion prevalence could not be established.

Ethnicity-wise, all OM cases were recorded at highest frequency in Malays. This may be due to Malays being the majority ethnic group (91.5%) visiting the undergraduate dental clinic, followed by Chinese (6.0%), Indian (0.8%) and others (1.6%). A previous study conducted in Malaysia had similar results, which majority of the subjects were Malay (53.6%), followed by Chinese (22.7%), and Indian (23.6%).

Conclusion

The current study identifies the most common OM cases encountered in the IIUM undergraduate dental polyclinic. The results portray the disease burden in Kuantan population in general. The findings could serve as a baseline data for future studies of OM cases in the general population at a national level. Knowledge on the common cases presenting at dental practice is crucial especially for the teaching institutions to prepare safe and competent future clinicians with basic management skills required in daily practice.

Further studies targeting a larger population is recommended. A national level study involving multiple centers would yield better insight for the current oral disease distribution in the Malaysian community.

Acknowledgement

The authors would like to acknowledge the clinical staff for their assistance in retrieval of patients' dental records and to Asst Prof Dr Mohammad Syafiq bin Mohd Ibrahim for his statistical guidance.

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