A retrospective analysis of referral patterns to a university oral medicine clinic

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Objectives. The aim of this study was to analyze referral patterns to a university-based oral medicine (OM) clinic and to identify access issues to OM care.

Study Design. A retrospective patient chart review on all OM specialists at the University of Alberta (Edmonton, Alberta, Canada) over a 1-year period was performed. Data collected included patient age and gender, referring clinician training and experience, reason and urgency of referral, provisional and final diagnosis, and the referral times. Proportions for data points were collected by using a 95% Wilson Score confidence interval. Two-sided Fisher's exact tests were performed for significant differences.

Results. In total, 924 patients were included. Dentists referred 81.4% of the cases, with the remaining cases referred by physicians. Patients traveled, on average, 55.44 km to the OM clinic, with a mean wait time of 105.5 days. White/red lesions were the most common referral reason (38%), with the tongue (21.8%) being the most common site of concern. There was no significant difference in the accuracy of provisional diagnoses between clinician types. Immune-mediated conditions were the most common final diagnosis.

Conclusions. The referral patterns of dental and medical practitioners are similar, with mucosal lesions being the most common referral reason. In our study population, access to care was compromised by wait times and travel distances. (Oral Surg Oral Med Oral Pathol Oral Radiol 2019;128:381−385)

Oral medicine (OM) specialists are involved in the diagnosis and management of patients with a variety of oral conditions ranging from developmental disorders to infectious, neoplastic, or immune-mediated conditions, as well as orofacial pain and neurosensory disorders. The scope of practice additionally includes dental management of patients with medically complex conditions. Previous studies in the United States, Australia, and Europe have examined how this specialty focus is integrated or utilized in the health care system by assessing the referral patterns to OM clinics; however, no similar data are available for Canada, a country where OM is a recognized dental specialty.[1-6] Specifically, the types of clinicians making referrals to OM clinics and the nature and appropriateness of these referrals are unknown. Previous studies have shown similarities with regard to the types of conditions seen across countries. However, there are some noticeable differences in the sources of referrals because physicians utilize OM services more heavily in the United States. There are differences in medical coverage between Canada and the United States; with OM representing the middle ground between medicine and dentistry, clarifying the differences in OM referrals and practice can help guide future policies and impact reimbursement. The clinical practice referral patterns can best be clarified by analyzing the patients seen in an OM clinic. This information can be compared with that from other studies to understand how OM practice differs globally. Assessing the differences among countries can provide an insight into the training of both undergraduate dental practitioners and OM specialists in each respective country. This knowledge can inform further educational changes to enhance OM care globally.

The objective of this study was to characterize and analyze referral patterns to a university-based outpatient OM clinic and to identify access-to-care issues for this referral patient population.

MATERIALS AND METHODS

This study was a retrospective and descriptive chart review that was conducted with the aim of describing the relationships among different aspects of the process of referral to an OM clinic.

Study population

Patient records from all new patients seen over a 1-year interval (January 1, 2015, to December 31, 2015) in the OM specialty referral clinics at the University of Alberta

Statement of Clinical Relevance

Increased awareness of the referral patterns of clinicians to oral medicine clinics can provide a basis for curriculum and government policy development, with the goal of improving timely oral medicine care.

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Received for publication Mar 5, 2019; returned for revision Apr 2, 2019; accepted for publication Apr 8, 2019.

2212-4403/$-see front matter
https://doi.org/10.1016/j.oooo.2019.04.007

(Edmonton, Alberta, Canada) were evaluated. This location represented the only specialty-recognized OM clinic in the province of Alberta (2015 population: 4.14 million) in 2015. Three specialists worked in the OM clinic for a total of five 3-hour clinical sessions a week. On average, each specialist saw 7 new patients, during a clinical session. The study was approved by the Health Research Ethics Board at the University of Alberta.

Data collection

Data from all patients was recorded and stored in a password-encrypted spreadsheet program. The variables included patient's age and gender, type and practice experience (in years) of the referring clinician, referring clinician practice experience in years, time between referral and appointment, reason for referral, nature of referral (urgent or routine), provisional diagnosis, and final diagnosis based on specialist evaluation. The final diagnoses were grouped into 10 general diagnostic categories by using a modified taxonomy outlined by Villa et al.[1] In cases with greater than 1 diagnosis, the diagnosis related to the reason for referral was recorded. The referral forms included a section where the clinician was asked to indicate whether the referral was urgent; this was specifically noted in the data collection. The distance each patient traveled from his or her home to the clinic was calculated by using Google Maps.

Statistical analysis

Data points were recorded and organized by using Microsoft Excel (Microsoft Corp., Redwood, WA). The analysis included descriptive measures of the proportions of referring clinicians, category of referral, category of diagnosis, location of lesion, and rates of urgency. Mean, median, and standard deviation (SD) were calculated for patient age, distance traveled, and wait times. The OpenEpi online software[7] was used to calculate the variability of the proportions by using 95% confidence intervals (CIs). When indicated, Fisher's exact test was used to determine the significance of the proportional differences.[8,9]

RESULTS

Patient demographic characteristics

Records were assessed for 924 patients (mean age 56.6 years; SD = 16.4 years; median = 59 years; range 4−101 years). Although there was a female predilection (61%), there were no significant differences in age.

Patient referral sources

There was a total of 607 unique referring clinicians (77% dentists and 23% physicians), and this was approximately reflected in the proportionate number of referrals (81% dentist referrals and 19% physician referrals). Each dentist referred, on average, 1.6 patients, and each family physician referred, on average, 1.2 patients. Referring dentists represented 19% of the total registered dentists in the province. From this group, approximately 9% were specialists, representing 14% of the total dental specialist population in the province. The most frequent referring dental specialists were periodontists (1.9% of total referrals), followed by endodontists (1.6%) and oral surgeons (1.5%). From the medical group, there were 124 family physicians (15.8% of total referrals) representing approximately 2.5% of all family physicians in Alberta. In addition to family physicians, medical specialists referred 26 patients to the clinic. The referring medical specialists were dermatologists (1.7% of total referrals), ear-nose-throat specialists (0.9%), and rheumatologists (0.2%).

Reason for referral

The spectrum of conditions that resulted in referrals is shown in Table I. The most common reason for referral was concerns about a mucosal abnormality, with cases with red and/or white oral lesions representing the majority of this group (38%). Most of these red/white lesions were immune mediated. Other than mucosal anomalies, patients with pain or other sensory disturbances comprised the next largest group (10.8%), with a wide range of disparate conditions comprising the remainder.

Site predilection

Site predilection of the lesions that triggered the referrals and the type of referring clinician were analyzed. Physicians most frequently referred cases involving the tongue and lips (31.6% and 13.5%, respectively). Dentists were more likely to refer cases involving the gingiva, tongue, and buccal mucosa (20.1%, 19.5%, and 17.5%, respectively). There was a statistically significant difference between dentists and physicians with regard to referrals of cases of the tongue ($P = 0.001$) and the lips ($P < 0.001$), with physicians referring cases involving these locations more frequently.

Urgency of referral

Dentists made urgent referrals in 17% of cases, whereas 7% of cases were referred on an urgent basis by physicians.

Table I. Reason for referral

Referral category	Number of cases n(%)
White and/or red lesion	351 (38.0)
Raised soft tissue lesion	219 (23.7)
Ulceration	104 (11.3)
Pain	100 (10.8)
Other*	82 (8.9)
Altered sensation	36 (3.9)
Pigmented lesions	32 (3.5)

*Includes cases with no description given, radiographic findings.

Ulcerations were most likely to be designated as urgent (28.8%; 95% CI 21.0%−38.2%). Practice experience did not affect the urgent referral rate ($P = .30$) Also, the location of the lesion had no statistically significant effect on the rate of urgent referrals.

Diagnosis

Table II shows the proportion of each OM final diagnosis classified into 1 of 10 diagnostic groupings. The most frequently diagnosed conditions were immune mediated (28.7%), and the second most frequent category was benign growths (18.2%). The least experienced dentist cohort (0−9 years of experience) made referrals for benign growths 26% of the time, which was significantly more ($P < .001$) than the most experienced cohort (30+ years of experience) who made referrals for benign growths 10.7% of the time. In contrast, the most experienced dentist cohort often made referrals for immune-mediated conditions compared with the least experienced cohort (40% and 21.2%, respectively; $P = .02$).

Accuracy of referrals

Only 25.8% of referrals included a provisional diagnosis. There was no statistically significant difference in the accuracy rate (agreement between provisional diagnosis and final diagnosis given by specialist) between dentists and physicians ($P = .218$). Clinical experience had no statistically significant effect on the rate of accurate provisional diagnoses of dentists ($P = .784$). Osteonecrosis, salivary gland disorders, and dysplasia were the provisional diagnoses that were most frequently accurate (100%, 87.5%, and 74.2%, respectively). Immune mediated conditions were given an accurate provisional diagnosis 63.5% of cases, while normal anatomy was given an accurate provisional 0.0% of the cases.

Access to care

Two issues pertaining to access to care were assessed—the distance traveled and elapsed time after referral and before the appointment. It was observed that 52% of patients were not from the proximate urban center, and overall, the mean distance traveled to reach the OM clinic was 55.44 km (SD = 147.6 km; median distance = 16.6 km; range 1.4−2028.0 km).

The mean wait time between initial referral and the first appointment was 105.5 days (SD = 75.3 days; median = 93 days; range = 1−905 days). Urgent referrals were about half of routine referrals (55 days and 114 days, respectively). However, only 18.7% of patients with urgent referrals were seen within 2 weeks.

DISCUSSION

The patient demographic characteristics in this study were consistent with findings from other countries where similar studies have been undertaken.[1,2,3,9] The majority of patients were females (61%; mean age 56.6 years). The fact that more women than men were referred does not align with oral lesion prevalence studies.[10−12] However, women appear to be more motivated to seek health care, which could account for their increased representation in the referral population.[13,14]

The majority of referrals in this study came from dental practitioners, with general dentists representing the most common source. This is not unexpected because dentists and physicians tend to make referrals within their peer health care communities.[13] Only 19% of the referrals in this study came from physicians, which is in contrast to a study by Villa et al., who found that two-thirds of referrals came from physicians.[1] This finding is in line with a study in Australia, which showed 82% of referrals from dentists, which may be explained by the similarities in medical and dental models between Canada and Australia.[2] This indicates local, geographic variability in how OM clinics are accessed. It is possible that some OM practices in the United States have better cooperation with their medical counterparts, compared with those in Canada and Australia. However, in our study, when physicians did access OM services, the referral rate was the same as that of

Table II. Final diagnosis

Diagnosis category	Common examples	Number of cases n(%)	Proportion correct provisional diagnosis*
Immune-mediated	Lichen planus, aphthous ulcer	265 (28.7)	63.5% (53.9%−72.1%)
Benign growths/Neoplasms	Fibroma, papilloma	168 (18.2)	71.4% (55%−83.7%)
Dysplasia/Cancerous lesions	Leukoplakia, oral carcinoma	120 (13.0)	74.2% (56.8%−86.3%)
Other	Glossitis, amalgam tattoo	80 (8.7)	50.0% (18.8%−81.2%)
Reactive keratosis	Hairy tongue, benign keratosis	79 (8.6)	21.4% (7.8%−47.6%)
Orofacial pain disorders	Burning mouth syndrome, TMD	77 (8.3)	68.2% (47.3%−83.6%)
Other—normal anatomy	Mandibular torus, palatal tonsil	50 (5.4)	0.0% (0.0%−39.0%)
Salivary gland disorders	Xerostomia, Sjögren syndrome	41 (4.4)	87.5% (52.9%−97.8%)
Infections	Candidiasis, herpes, fungal	37 (4.0)	45.5% (21.3%−72.0%)
Osteonecrosis of the jaw	Medication related, spontaneous	7 (0.8)	100.0% (20.7%−100.0%)

TMD, Temporomandibular disorders.
*95% confidence interval (Wilson Score).

dentists. This suggests a lack of awareness among medical clinicians of the availability of OM services, but when there was recognition of this expertise as useful for referral, the medical and dental utilization rates were similar. Increasing awareness in and support from the medical community may alter the existing referral patterns and improve the health care outcome for patients who do not normally seek dental care.

White and/or red lesions were the most common reason for referral, and this finding is similar to those of other studies.[4] White/red lesions are sensitive lesions and are often associated with a high risk for malignancy. Thus, it is not surprising that these referrals are seen with such frequency.

Information regarding the location of the lesion was not specifically requested on the OM clinic referral forms; however, the majority of referrals indicated a location (80%). The tongue was the most common anatomic site of concern; this finding is consistent with those from other studies.[3,4] Physicians were more likely to refer cases involving the tongue ($P = .001$) or lips ($P < .001$) compared with dentists. This may represent the different types of clinical examinations each practitioner may perform or simply represent the various types of patients seen in physicians' clinics.[14,15]

There was a statistically significant difference in the urgent referral rate between dentists and physicians (16.9% vs 7%; $P < .001$). This finding may be explained by the fact that physicians see life-threatening conditions more often and have a lower threshold for an urgent OM referral. Alternatively, dentists may be more aware of the potential adverse outcomes of certain oral conditions and have a higher index of suspicion.

Our study data did not show a statistically significant higher rate of urgent referrals for areas of the mouth that are deemed "high risk," such as the tongue or the floor of the mouth. We did not differentiate between the lateral/ventral tongue and the dorsal tongue, and this may have resulted in this finding. Referrals for ulceration were most closely correlated with being urgent (29%). We were not able to ascertain why a referring clinician considered something urgent. Painful lesions or lesions that are considered to present a high risk of malignancy should be referred urgently, but it is not known if this informed the decision-making process in the cases reviewed.

The proportions of final diagnoses seen in the OM clinic may provide an insight into the cases more commonly seen by OM specialists and can inform the graduate curriculum. It also provided insight into the type of diseases that dental and medical practitioners are not comfortable managing and may provide an opportunity for improvements in dental/medical education. Our study data provided the opportunity to compare the lesions seen in the OM clinic with the background rate of different oral diseases.[16-19] As shown by this and earlier studies, it is clear that despite the wide variety of diseases seen in the OM clinic, only a small proportion of patients with oral mucosal pathology are managed in an OM clinic and that many of these patients are receiving less than optimal treatment from other clinicians.

Despite the fact that physicians reported low levels of confidence in diagnosing oral lesions[14,20-22] the difference in the rates of diagnostic accuracy between physicians and dentists was not statistically significant (70.2% and 59.2% respectively; $P = .218$). There are several potential reasons for this, primarily that dentists may be referring more complicated cases to OM clinics, whereas primary care physicians tend to manage routine cases. Knowledge of the care provided by the OM specialty is lacking among physicians in Canada, and, thus, further studies should be undertaken to assess the reasons for this.

Of our study patients, 84% came from within 50 km of the OM clinic. This is consistent with the finding that increased distances are a barrier to access of care because of increased travel times and potential loss of income.[23-25] Reimbursement of the cost of OM care in Canada varies regionally, with some treatments being funded by government and some others requiring private insurance coverage or funding. The mean wait time in our study cases was 105.5 days, with routine referrals having a mean wait time of 113.8 days, and urgent referrals having a mean wait of 59.0 days. Although a wait time of 59 days appears too long, it appears that further triaging of urgent referrals occurs in the OM clinics. The "urgent" cases in our study were potentially downgraded to "routine" after review of the clinical information; subsequently, only 18.7% of urgent referrals are seen within 2 weeks. A period of 3 months is often cited as a critical time frame to reduce patients' physical and psychological stress; thus, the waiting times identified in this study are an obvious concern.[26-28] The long wait times can be attributed to the limited number of clinical sessions. The OM specialists in the cases included in this study are academics, who are not devoted to full-time clinical practice, and this could explain the long wait times. However, the extent to which these data can be generalized to other health care jurisdictions is not known. Patients living in many regions of Canada have even less access to OM specialists, with Alberta only having 3 board-certified clinicians at the time of this study. Patients in such regions are significantly affected by decreased accessibility. These findings highlight the importance of increasing the number of OM specialists across Canada to help reduce unacceptably long wait times and long travel distances.

An important limitation of this study is its retrospective nature, which restricted further analysis of the reasons for referral and exploration of perceived urgency. A more important area to assess would be the lack of referrals by clinicians. This is a more critical group to study the reasons for not referring patients for OM

care. Another limitation is the single-center design of the study. Although this center is the only recognized specialty OM clinic in the province, located in a cosmopolitan urban area that is to other Canadian urban centers, it is unlikely that all of the demographic parameters are precisely equal. Thus, caution is obviously needed in the extrapolation of the results.

CONCLUSIONS

In summary, this study demonstrated that the referral patterns of both dental and medical practitioners were similar. Mucosal lesions were the most common reason for referral, with ulcerations being the condition often deemed urgent. Overall, OM assessment resulted in a change in diagnosis in 37.8% of cases where a provisional diagnosis had been provided by the referring clinician. Access to OM care in the study population was compromised by extended wait periods and a lack of proximate clinics. Referral patterns differ between Canada and the United States with regard to referral sources but are similar in patient demographic characteristics and the conditions managed. These data may help support the future development of curricula for dental students and OM residents and inform the designing of continuing education courses of dentists and physicians.

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