Educational Article

Knowledge and practices of dentists in France regarding oral mucosal diseases: a national survey

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Abstract – Introduction: One of the dental surgeon's roles is to identify, diagnose and supervise the treatment of oral pathologies (OP), and/or to refer patients to the appropriate specialists. Today, the delay in diagnosing patients with OP is very long and may impact their prognosis. **Objective:** We conducted a national survey of French practitioners to estimate their knowledge and practices regarding the management of these pathologies. **Methods:** About 15,000 dentists were contacted by email to complete a questionnaire designed to assess the diagnoses and management of OP. **Results:** Overall, for 560 answers (3.8%), DS did not declare any significant difficulties in diagnosing and managing any kind of pathologies. However, we were able to distinguish statistical differences among practitioners depending on the type of lesions and between the practitioners themselves. The associated factors were gender, graduation year, mode of practice and continuing education over the last 5 years. The majority of DS justified their diagnostic difficulties by the fact that they do not encounter patients with these types of pathology frequently enough, and by insufficient education. **Conclusion:** According to our study, it is necessary to reinforce the training and the continuing medical education of DS regarding OP, especially through the use of practical cases.

Introduction

Oral mucosal lesions are numerous and have multiple origins. According to a study carried out in Marseille in 2015, these lesions affect up to 61% of the general population [1].

Observation of the oral mucosa at each dental consultation allows the practitioner to detect these pathologies early. Lesions such as squamous cell carcinoma and those resulting from certain systemic diseases such as HIV, leukemia, lymphomas, anemias and pemphigus require early identification. In most cases, an early diagnosis provides better chances of recovery [2]. Conversely, delays in providing diagnostics for these patients can impair their prognosis [3].

Numerous studies have focused on the prevalence of these lesions in the general population [1,4], but few of them analyzed the perception and knowledge of dentists concerning the diagnosis and management of precancerous and cancerous lesions [5–7]. These studies highlighted the need to improve the education of dental surgeons with respect to their ability to examine and diagnose cancer lesions. This idea is also shared

among practitioners who think that they could better detect and diagnose these pathologies through reinforced continuing training [5–8]. Dental surgeons have a key role to play in the early detection of lesions of the oral cavity, as highlighted by the High Authority of Health and the National Cancer Institute [9].

Only two studies in the literature focused on the ability of dentists to diagnose and manage the different types of oral mucosal disease [8,10]. These studies showed that DS had problems in diagnosing and managing various oral mucosal diseases and highlighted a lack of graduate and postgraduate training on the topic. Other explanations such as the lack of interest or motivation of practitioners to detect oral mucosal diseases were identified. To date, no such study has been conducted in France. We performed a national survey to evaluate the capacity to identify, diagnose and manage oral mucosal diseases during consultations by French dental surgeons.

The other objectives were to describe the circumstances in which a complete examination of the oral cavity of the patients is carried out, to specify the initial workup prescribed according to the type of diseases observed and the specialists to which

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- 1 – Do you routinely perform at each appointment a clinical examination of the oral mucosa in order to detect oral mucosal lesions ? ☐ Yes ☐ No
- 2 – If not, when do you perform a global examination of oral mucosa ?
☐ At the first appointment ☐ During a monitoring appointment ☐ When the patient complains ☐ No global examination of oral mucosa ever
- 3 – During your daily practising, have you already faced any oral mucosa lesions on a patient ? ☐ Yes ☐ No.
 How many of these lesions are you observing on average every month ? [_____]
- 4 – If not, why ? ☐ You don't consider it; ☐ You don't judge it necessary; ☐ You don't have time; ☐ You don't have patients presenting these pathologies.
- 5 – In which cases do you prescribe further examinations, and which one of them ?

	Dental panoramic	Scanner, cone beam	Blood test	Biopsy	Bacterial sampling
swelling					
Ulcerous and erosives lesions					
Bullous or veliculous diseases					

- 6 – Do you perform biopsies in your office ? ☐ Yes ☐ No
- 7 – When observing a lesion of the oral mucosa, what do you do ? ☐ You diagnose and treat on your own; ☐ You address the patient to a specialist for the diagnosis and the treatment : ☐ Dermatologist; ☐ Stomatologist; ☐ General practitioners; ☐ Dentist surgeon specialised in oral surgery
- 8 – Assess between 0 and 5 yours difficulties to diagnose the lesions and pathologies listed below: (0 : no difficulties; 5 : many difficulties)
- 9- What are the reasons of theses difficulties in diagnosing these lesions ? ☐ Insufficient initial education on the subject; ☐ Rarity of continuing educations on the subject; ☐ Not enough information in the literature on the subject; ☐ Not enough patient presenting this kind of pathologies
- 10 – Assess between 0 and 5 your difficulties to take care and treat the lesions and pathologies listed below: (0 : no difficulties; 5 : many difficulties)
- 11- Why are you facing difficulties in taking care of these lesions ? ☐ You are not confident in the diagnosis; ☐ You don't have enough knowledge on these lesions; ☐ You don't have time

Fig. 1. Key questions for dentists.

patients were then referred to. Finally, we analyze the reasons given by the practitioners to explain their difficulties in diagnosing or taking care of these lesions.

Material and methods

Like other similar surveys performed on the topic of antibiotherapy [11], the survey was conducted in collaboration with the French Union for Oral and Dental Health (UFSBD, Union Française pour la Santé Bucco-Dentaire), the group of dental surgeons with the largest number of members. This group does not involve any professional orientation or specialty (surgical or other). Thus, it allows interviewing a large population of general DS practitioners. This association had 15,000 members in 2017. The target population for the study was, therefore, all graduate dental surgeons in France and members of the UFSBD (there are 42,589 DS in France – DREES 2017).

Twenty faculty practitioners from three French dental schools reviewed the questionnaire prior to its administration.

After validation, the questionnaire was sent to the UFSBD, which was responsible for sending it by email to its members, with up to three reminders (Fig. 1). The link was anonymous

and accessible by smartphone or computer from May 19th to July 13th 2017.

This questionnaire consisted of 22 questions and was divided into three parts: the first one was devoted to the identification of lesions, the second to diagnostic and management difficulties (practitioner self-assessment for different diseases, based on a difficulty score ranging from 0 to 5 (0: no difficulty, 5: numerous difficulties) and the reasons for these difficulties. The third and last part was focused on the demographic characteristics of the practitioner.

At the end of the study period, the UFSBD sent us the results in an Excel file.

Comparisons of the different proportions involved the Chi-square test or Fisher's exact test as appropriate. Quantitative data were compared by Student's *t*-test. $P < 0.05$ was considered statistically significant.

Results

The response rate was 3.8%, mostly private practitioners, with an average of 20 years of practice, and almost all of them were subscribed to journals and had participated in professional conferences over the past 5 years.

Fig. 2. Demographic aspect of the cohort of dentists. Map of France representing the spatial distribution of responses. Red zone: no response; yellow zone: less than 5 responses; light green zone: between 4 and 11 responses; dark green zone: between 11 and 20 responses and blue zone: more than 20 responses. The majority profile of responding dentist surgeons was: woman, in large urban zone, with 20 years of practice and who follows continuing education.

This survey collected 560 responses from the 15,000 emails sent to practitioners by the UFSBD (3.7%). Women represented 61% of the respondents (441).

The median number of years' practice in our sample was 22 years. The primary mode of practice was private practitioner-owner of own surgery (78%). The spatial distribution of dentists was fairly well distributed over France with a majority of responses from large cities like Paris, Toulouse, Bordeaux and Lyon. Most of the dental surgeons reported working near a dental emergency center or hospital center (70%) (Fig. 2), and almost half of the training courses given concerned oral mucosal diseases (with a decrease in recent graduates, who represented only 35% of trainees).

About 41% of the practitioners said that at least one of the training courses attended during the 5 past years focused on the diagnosis and management of oral diseases. Among them, 25% considered that it was difficult to find training courses on this topic. About 20% of the practitioners surveyed considered that it was not their specialty, 16% said they were not interested in it and 8% did not find time to participate (Fig. 2). On the other hand, virtually none of the practitioners who had graduated after 2012 had received training on this topic and half of them considered that it was not their specialty. This figure included Parisian dentists.

Almost all our samples reported observing oral mucosal diseases, but complete clinical examination of the oral mucosa was not routinely performed at each appointment and 27% on average did not prescribe any additional workup.

About 95% of the practitioners admitted encountering oral pathologies in their daily practice with a median of three diseases per trimester. About 65.5% of the practitioners reported complete examination of the oral mucosa during the first consultation, 27% at each appointment before any clinical action and on control and 7% never did so (Fig. 3a). Interestingly, one-third of practitioners refused to answer the question on the additional workup they prescribed. Based on the actual answers, the panoramic is the test most prescribed in the case of a swelling, while biopsies and blood tests are the most commonly prescribed tests for ulcerative or bullous lesions (Fig. 3b). A seventh of our sample declared that they performed biopsies in their office, and this was the test that the practitioners prescribed most often for single or multiple ulcerative and bullous lesions (Fig. 3c).

Practitioners acknowledged that they did not diagnose or treat their patients suffering from oral mucosal lesions themselves, and if hospital management was required, the distance between their place of practice and the hospital was not a parameter of importance.

Fig. 3. Oral lesions: initial assessment, complete clinical examination and prescription of additional examinations. (A) Frequency and modality of performing complete clinical examination. (B) Type of additional examinations prescribed when a dental surgeon identifies an oral lesion (all types of lesions confounded). (C) Type of additional examinations prescribed according to the type of the lesion.

Dental surgeons primarily sent their patients to stomatologists (55%), then to dental surgeons specializing in oral surgery (29%), 10% tried to diagnose and treat these lesions themselves and less than 6% redirected them to general practitioners or dermatologists. The distance separating a place of practice from a hospital center did not influence the number of patients that a practitioner referred there, although 30% of them emphasized that they were not close.

All diseases combined, the practitioners surveyed stated that they had no major difficulties in diagnosing and managing oral mucosal diseases, but this score varied according to different criteria: type of pathology encountered, and the practitioner's gender, age and year of graduation. When facing diagnostic challenges, practitioners explained these difficulties by a lack of professional experience in this subject.

The average score assigned by practitioners to assess their difficulty in diagnosing all pathologies and managing them was 1.97 and 2.28 on a scale of 0 to 5, respectively. The scores attributed varied according to the following:

- *The different pathologies:* The self-declared most challenging diseases to diagnose and manage by the practitioners surveyed were carcinoma, pemphigus and oral manifestations of systemic diseases (leukemia, anemia), with a median score above 3, while apotheoses, traumatic lesions and herpes were considered easy to diagnose and manage, with a score lower than 1 (Tab. 1).

- *The practitioner's gender:* The men questioned declared fewer difficulties than women did. The men's average scores (diagnosis and management) for all pathologies were 1.8 (for diagnostics) and 2.1 (for management) while the women's average scores were 2.1 and 2.4 ($p < 0.01$) (Fig. 4).
- *Year of graduation:* The difficulty scores among more experienced practitioners (graduated between 1970 and 1985) were lower than those who graduated after 2012 (2.39 versus (1.94–1.94–1.86) for diagnosis and 2.72 versus (2.28–2.24–2.18) for management with $p < 0.001$) (Fig. 4).
- The area of practice affected only the score assigned for the management of oral mucosal diseases and not for diagnosis. Practitioners from areas labelled medical deserts such as the northern region of France said they had fewer difficulties in caring for these pathologies than those practicing in Paris, for example (2.16 versus 1.90, $p = 0.017$) (Fig. 4).
- The mode of practice: Hospital practitioners and dental surgeons working in academic centers had a better score than others ($p < 0.001$) (Fig. 4).
- The number of training courses practitioners have attended over the last 5 years: Practitioners who participated in at least one of the four types of course proposed in the study had lower average scores regarding diagnosis and management difficulties than those who did not participate in any training course (2.63 versus 1.75 for diagnosis and 2.84 versus 2.02 for management). The scores obtained when

Table 1. Average score for diagnosis and treatment for each pathology.

PATHOLOGIES	AVERAGE score for diagnosis		AVERAGE score for treatment management	
	Average	Standard variation	Average	Standard variation
Carcinome épidermoïde	3.079	1.37	3.898	1.60
Epulis	1.254	1.48	1.7858	1.71
Manifestations orales de maladies systémiques	3.471	1.23	3.5539	1.49
Aphthose	0.78	1.01	1.098	1.39
Lésion traumatique	0.588	0.95	0.462	0.93
Herpès	0.934	1.09	1.044	1.28
Zona	2.392	1.42	2.439	1.69
Pemphigus	3.364	1.43	3.473	1.44
Glossodynie	2.24	1.52	3.011	1.64
Candidose	1.406	1.09	1.406	1.28
Lichen Plan	1.896	1.24	2.254	1.57
Leucoplasie	2.306	1.43	2.990	1.61
TOTAL	1.97	1.60	2.28	1.83

practitioners said they participated in all four types of course was even better ($p < 0.05$) (Fig. 4).

- *The type of training:* Practitioners who participated in training on the subject of oral mucosal diseases had lower difficulty scores than those who did not participate in any training on this subject ($p < 0.001$).

The main reason why practitioners experienced difficulties in diagnosing and managing oral lesions was a lack of professional experience in this topic. Indeed, 77% declared that their difficulties arose mostly from a lack of patients with this type of disease in their surgery, and this percentage was even more pronounced for practitioners who had graduated after 2012 (93%). Inadequate initial training appeared to be the second reason with 52% of responses, while lack of continuing education came third with 36% of responses. Only 10% of the respondents found that there was a lack of information on oral mucosal diseases in the literature.

The practitioners explained that they did not attempt to provide care for oral mucosal diseases because they were unsure of their diagnosis and considered that they did not know enough about these lesions.

Indeed, 70 and 67% of dental surgeons ticked the choices: “I am unsure of my diagnosis” and “I do not have enough knowledge on these lesions” to explain their difficulty. Only 8% admitted that they did not have the time to care for them.

The indication of a lack of knowledge on these diseases was very high among young graduates since 88% of them ticked this answer.

Discussion

Few studies on the opinions and attitudes of dentists encountering oral mucosal diseases have been conducted [8,10]. We report the first French survey on this topic on a sample of dentists. The response rate of our survey was 3.8% (570 responses). This rate was roughly similar to other UFSBD surveys. Sending a questionnaire by email is the easiest way to obtain the highest number of answers since it can be sent to a broad range of persons, without geographical and organizational constraints. Moreover, the questionnaire was anonymous and computerized, which favors sincere answers. Although it allowed reaching a very broad population of dentists, thanks to the mailing list of the largest association of French dentists, only a few practitioners responded, possibly inducing a selection bias.

Indeed, this study has limitations. Indeed, it is a declarative study involving self-evaluation, not necessarily reflecting the professional activity of the dentist and their real capacities. Moreover, there is a selection bias in the sample, since the questionnaire was not sent to all French DSs, and there is a volunteering bias since the results are based solely on the

A : Difficulties for diagnostic **B : Difficulties for management**

Fig. 4. Variation of practitioner's difficulties in diagnosing and managing the pathologies of the oral mucosa according to sex, hospital activity and continual education. (a) Difficulties of diagnosis according to gender, hospital activity and continual education. The white zone represents the category with the least difficulties, the light grey zone intermediary difficulties and the dark grey zone the most difficulties. (b) Difficulties of management according to gender, hospital activity and continuing education. The white zone represents the category with the least difficulties, the light grey zone intermediary difficulties and the dark grey zone the most difficulties.

population that accepted and took the time to answer the questionnaire investigation. Furthermore, the difficulty score does not refer to a validated scale.

Almost all our sample reported encountering mucosal diseases in their daily practice and a majority of practitioners performed a clinical examination of the oral cavity at each initial visit. These results were consistent with the various studies already conducted. Indeed, international studies on the detection of cancerous lesions and other oral mucosal lesions showed that more than three-quarters of Scots, Australian and Turkish practitioners perform an initial clinical examination of each patient [6,7,10]. This raises the question: why do such long delays exist in the diagnosis of many diseases affecting the oral mucosa, such as oral squamous cell carcinoma [3]? One answer could be that practitioners do not repeat the clinical exam of the oral cavity for every patient visit. Indeed, the

detection of oral mucosal diseases requires regular monitoring of the patients with visual examination and palpation at each consultation [12]. Moreover, the clinical examination of the oral cavity should follow a careful protocol to be sure not to miss a lesion. However, we hypothesize that dental surgeons are not trained well enough to perform it. Indeed, in 2006, a study found that 60% of dentists did not feel sufficiently trained in clinical practice and a survey carried out in Paris in 2015 revealed that 32% did not feel sufficiently trained to perform a thorough examination of the oral cavity [13]. This lack of clinical examination was also found in a survey of dermatologists in the United Kingdom and Ireland, where two-thirds did not perform an oral examination [14].

The practitioners in our survey did not diagnose or treat their patients with oral mucosal lesions by themselves and were more likely to refer them to specialists. An Italian study

corroborated these results and showed that many dentists sent their patients to specialized services to diagnose and treat their diseases [8]. In another survey performed in Auvergne in France on activity in dentists' practices, only 10% performed biopsies and 17% exeresis of the mucosal lesion [15]. Our study revealed that whatever the area of practice (large city/medical desert) or the proximity with specialized centers, dentists send their patients with oral mucosal diseases to specialists or to hospital and dental emergency centers. As pointed out in our study, this is probably due to a lack of interest among dentists in these pathologies. Indeed, our study highlights that only 41% of the practitioners had participated in a training course on oral mucosal diseases during the last 5 years and almost one-third of the practitioners of our sample considered that oral mucosal diseases were not within the scope of their specialty. This feeling was even more prevalent among the young graduates of our study though this contrasts with findings from other countries: only 10% of Turkish dentists think that oral mucosal lesions do not correspond to their specialty and young Turkish graduates are even more likely than older graduates to be interested in oral mucosal diseases [10]. Our results seem surprising compared to the growing number of French training sessions offered on this topic (143 in 2009) in view of policies pursued to encourage good practices among dentists in the detection of oral diseases: online information, training modules and online resources for self-training in oral mucosal diseases (National Cancer Institute –INCa 2007, Council of the Order of Dental Surgeons, French National Cancer Institute). Initial training focused on the practitioner's role in screening for diseases [12] and directed work have been initiated to improve students' management of them [16]. Thus, increasing dentists' awareness of these diseases and their interest in them seems essential to increase their desire to attend further training in oral cavity care. In addition, it is important to note that as early as 2009, in a study covering the whole of Europe, certain authors had already decided that the field of competence of dentists should cover the diagnosis of oral mucosal pathologies and their management [17].

While the majority of the practitioners in our study addressed their patients with OP to specialists, they did not declare any major difficulties in the care or the diagnosis of these pathologies. These results differed from previous studies that showed that dentists had difficulties diagnosing or treating these diseases [8,10,12]. However, difficulties in diagnosing OP vary considerably as a function of the diseases encountered. As in the studies conducted in Turkey, Italy and Spain, lesions considered less difficult to diagnose were traumatic and ulcerous lesions, which are more frequent. Those perceived to be more difficult to diagnose were pemphigus, oral manifestations of systemic diseases and squamous cell carcinoma [10]. These differences can certainly be explained by the differences in the frequency of these pathologies in the general population [1].

In addition, the score assigned for the diagnosis or management of squamous cell carcinoma seemed particularly high despite the fact that these lesions often have recognizable

clinical signs. The Spanish study showed that more than half of all practitioners are able to diagnose cancerous diseases [7]. Practitioners probably have more difficulties in prescribing the appropriate workup and managing the treatment of these pathologies than in identifying cancerous diseases. This would also explain the lack of response to the question on a supplementary workup performed after the diagnosis of these lesions in our survey.

The difficulties encountered in the diagnosis and management of pathologies such as pemphigus or oral manifestations of systemic diseases were consistent with the delay and mistakes in diagnostics reported in many papers (Economic and Social Council and Barataud B. 2001, Association Pemphigus Pemphigöide France 2015). Delays in diagnosis can have serious consequences for the health and management of patients and lead to decreased survival [18].

The scores attributed to the difficulties in the diagnosis and management of oral mucosal pathologies also varied according to the demographic characteristics of the practitioners.

Only a few studies compared results taking into account gender, the place of practice or method of practice. In our study, the younger dentists (less than 5 years practice) encountered more difficulties in diagnosis than more experienced practitioners. These results differed from the two other studies that showed that younger practitioners (who graduated less than 10 years ago) are more likely to screen for oral cancers [5] and that this was directly correlated to improvements in dental school training and in continuing medical education [12]. In addition, a previous study demonstrated that the performances of practitioners in managing OP increased with experience, until declining later in their career, probably due to a lack of continuing medical education [19]. We also found that the number of training courses attended in the last 5 years improved the self-declared diagnostic efficacy of practitioners.

By comparing the different results of our study to the literature, we hypothesize that French dentists – especially the younger ones – lack both training and experience in managing OP. To evaluate the effectiveness of new teaching methods regarding OP diagnostics and management at dental schools, and during continuing medical education, it would therefore be useful to re-interview practitioners in a few years' time. Finally, it would also be useful to build networks between private practices and hospitals to help practitioners to diagnose and manage oral pathologies.

Conclusion

Our study revealed that delays in the diagnosis of oral mucosal diseases are associated with a lack of experience and interest of French dentists in identifying these lesions. This is the first study conducted on this subject in France and it allowed targeting the pathologies for which dentists say they have diagnostic and management difficulties. Moreover, our study highlighted the lack of clinical experience of facing such

cases as a cause of these difficulties compared to the other studies that insist on the lack of training. We provided evidence that French dentists do not systematically examine the oral cavity and that they experience difficulties in diagnosing squamous cell carcinoma, which is worrying given the role of DCs in the screening of malignant lesions [20]. The specialty of oral medicine is recent and dates from 1950 in Europe. However, it is officially recognized only in Croatia and the United Kingdom [21]. Despite broad consensus in oral medicine programs in Europe, there are still significant differences in its definition. We therefore recommend strengthening the initial and continuing education of dentists with regard to oral pathologies through the use of practice cases with pictures. Setting up networks facilitating communication between specialists in oral diseases and practitioners working in private practices could also accelerate diagnosis and patient care and thus improve the prognosis of certain diseases.

Conflict of interest

The authors declare that they have no conflicts of interest in relation to this article.

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