GRADUATION PROJECT

Dentistry degree

ASSESSMENT OF KNOWLEDGE IN ORAL MEDICINE AMONG DENTISTS

Madrid, academic year 2022/2023

Identification number : 154

ABSTRACT

Introduction : Dentists are the main health care professionals to be confronted to potential oral lesions. Among them we can find several types of leukoplakia, candida related lesions, oral lichen planus, or oral squamous cell carcinomas. Considering this factor, dentists have a key role in the early detection of potential malignant lesions, and need to know how to manage clinical diagnosis, treatment, referral and follow up of oral pathologies and lesions.

Objectives : Observe and describe the actual opinions and knowledge of dentists, regarding oral lesions and oral cancer screening. Measure differences in awareness and attitude facing patients with oral lesions regarding the dentist's specialty.

Material and methods : A questionnaire containing 14 close ended questions concerning the main oral lesions has been handled to a sample of dentists. Most of the come from Spain and France. They had a period of 3 months to complete it.

Results : Applying the established exclusion and inclusion criteria of our study, a sample of 52 dentists answered our questionnaire. The amount of right answers among the 14 questions is 58,63 % . The average mean was 8.8/14. Highest mean was Periodontists, with 11/14 and lowest mean was general dentistry with 7.3/14

Discussion : Dentists tend to lack awareness on the location of the potential malignant lesions, risk factors and prognosis**.** It is believed that those lack of knowledge are due to rare up to dates trainings after graduation, and lack or prevention and patient's sensibilization during dental consults .

Conclusion : Up to date knowledge about oral premalignant and malignant lesions is essential for dentists, in order to optimize early diagnosis, treatment and referral of patients. Consistent and regular up to date training are key in order to raise awareness among professionals.

Keywords : Dentists, oral lesions, potentially malignant disorders, oral carcinoma, knowledge.

RESUMEN

Introducción : Los dentistas son los principales profesionales sanitarios que se enfrentan a posibles lesiones orales. Entre ellas, podemos encontrar varios tipos de leucoplasia, candidiasis, liquen plano oral o carcinoma oral de células escamosas . Teniendo en cuenta este factor, los dentistas tienen un papel clave en la detección precoz de posibles lesiones malignas, y necesitan saber cómo manejar el diagnóstico clínico, el tratamiento, la derivación y el seguimiento de las patologías y lesiones orales.

Objetivos : Observar y describir las opiniones y conocimientos de los dentistas, en relación con las lesiones orales y el cribado del cáncer oral. Medir las diferencias de conocimiento y actitud con un paciente presentando una lesión oral respecto a la especialidad del odontólogo.

Material y métodos : Se ha aplicado a una muestra de dentistas un cuestionario con 14 preguntas cerradas sobre las principales lesiones orales. La mayoría procedían de España y Francia. Disponían de un plazo de 3 meses para cumplimentarlo.

Resultados : Aplicando los criterios de exclusión e inclusión establecidos en nuestro estudio, una muestra de 52 dentistas respondió a nuestro cuestionario. La cantidad de respuestas correctas entre las 14 preguntas es del 58,63 % . La media fue de 8,8/14. La media más alta correspondió a los periodoncistas, con 11/14, y la más baja a la odontología general, con 7,3/14.

Discusión : Los odontólogos tienden a desconocer la localización de las posibles lesiones malignas, los factores de riesgo y el pronóstico. Se cree que esta falta de conocimiento se debe a la falta de formación actualizada tras la graduación, y de prevención y sensibilización del paciente durante las consultas odontológicas.

Conclusión: El conocimiento actualizado de las lesiones orales premalignas y malignas es esencial para dentistas, con el fin de optimizar el diagnóstico precoz, el tratamiento y la derivación de los pacientes. Una formación actualizada, constante y periódica es clave para sensibilizar a los profesionales.

Palabras clave : Odontólogos, lesion oral, trastornos potencialmente malignos, carcinoma oral, conocimientos.

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1. INTRODUCTION

Oral medicine is a particular field, closely linked to dentistry that focuses on the diagnosis and treatment of medical conditions linked to the mouth, temporo-mandibular articulations, and salivary glands (1). The oral cavity is an accurate reflection of the overall health of a patient. (2)

Dentists are the first health care workers exposed to eventual oral lesions, and in order to detect and prevent it, they have the ethical and professional responsibility to inform carefully their patients regarding the risk factors provoking those lesions.(3) They also have to integrate conscientious examination of oral an oropharyngeal tissues, and potential pre malignant lesions in their typical dental checkup routine (3,4).

Among the commonest lesions present in the oral cavity, we can find: oral lichen planus, leukoplakia, candida infection and oral squamous cell carcinoma. Amidst, we also can find pre malignant lesions, that are lesions that have an increased risk to develop into cancer (5). (Table 1)

Leukoplakia and oral lichen planus are part of the potentially malignant disorder lesions (1,6)

Table 1 : Most prevalent oral pre malignant disorders (5)

Leukoplakia	White plaque that cannot be rubbed off and cannot be characterized as any other condition
Erythroplakia	Persistent red patch that cannot be characterized as any other condition
Erythroleukoplakia	White lesion with a large red component

1.1 Oral lichen planus (OLP)

Oral lichen planus is an autoimmune T cell mediated inflammatory disease.(7) It can be triggered by several factors such as stress, dental materials, or several viruses like Epstein Barr virus (EBV), Human Herpes virus (HHV-6, HHV-7), Hepatitis C or Human Papillomavirus (HPV).(8)

It is often linked to typical skin and mucosal lesions besides the oral cavity, and is always bilateral. (4,5). On a histological point of view, it presents an infiltration of lymphocytes between the epithelium and connective tissue, and destroys the basal layer of the mucosa (7)

Its prevalence is of 5% in the overall population, and more present in women. This lesion usually doesn't present symptomatology, but some type of food (spicy, acidic) and toothpaste might not be supported by the patient. A follow up should be undergone every year to ensure the reduction or disappearance of the lesion. Symptomatic patients are encouraged to maintain a scrupulous oral hygiene and to avoid any irritating or spicy food intake. (9)

OLP can be classified in 3 main types :

1.1.1 Reticular Lichen planus :

The reticular type is the most common one, characterized by an asymptomatic white reticular pattern called Wickham striae, often located on cheeks or buccal mucosa. (8)

1.1.2 Plaque like Lichen Planus :

The plaque like type, is similar to leukoplakia, and is characterized by a whitish lesion with a smooth and irregular surface, located on cheeks or dorsal part of the tongue .It is the least common type of OLP. (10)

1.1.3 Atrophic erosive lichen planus

Atrophic erosive lichen planus occurs because the superficial epithelium is lost, provoking an erosion. It presents a red ulceration combined with Wickham striae at the border of the lesion, on the buccal mucosa, which can lead to a painful burning sensation. (10) According to a study performed by Miguel Angel Gonzales Moles (2019), the risk ratio (RR) for an atrophic erosive lichen planus undergoing malignant transformation is 4.09. Also, malignant atrophic erosive lesions located on the tongue are the most important ones. (11)

According to the World Health organization, OLP could be potentially malignant and lead to Oral Squamous Cell Carcinoma (OSCC). (8) Several risks factors involved in the development of OSCC have been identified but they are still discussed nowadays. Among them, we can find smoking, chronic inflammation, viruses, genetic mutations, and a diet that contains very few fruits and vegetables. The erosive lichen planus is the most susceptible to evolve into OSCC (7).

1.2 Leukoplakia

In 1978, World Health Organization (WHO), described Leukoplakia as a white plaque or patch that cannot be rubbed of, and that we can't identify as another disease (10,12). Later on, in 2005, the definition of leukoplakia has been changed into "A white plaque of questionable risk having excluded (other) known diseases or disorders that carry no increased risk of cancer", being the ultimate definition approved by WHO. (12)

Regarding its clinical aspect, Leukoplakia can appear as a smooth surface, or thin and susceptible of desquamation. It can present grooves and fissures, or be corrugated, verrucous, nodular or speckled. The WHO classified Leukoplakia it two major groups : homogeneous and non homogeneous. In the Non homogeneous group, we can encounter erythroleukoplakia, proliferative verrucous leukoplakia and nodular leukoplakia.(10) (Table 2).

The most frequent areas that can present leukoplakia is the floor of the mouth, but we can also find it in lateral and ventral tongue, alveolar mucosa, lip, soft palate, retromolar trigone, and the attached gingiva at the level of the mandible (10)

It is most likely found in smokers patients but also in immunosuppressive patients, presenting HIV or HPV (13). It is the most frequent premalignant lesion of the oral mucosa in Spain, with a prevalence around 0.5%, and is found more frequently in men from 45 to 65 years old (6-8). 1% of those patients may develop an oral cancer during the year of apparition of the lesion. (14)

Leukoplakia happens as a protection reaction against chronic irritating factors, such as tobacco, alcohol intake, syphilis, vitamin deficiency, galvanism, UV radiation, candidiasis, or amalgam (the dentist can verify the presence of amalgam restauration close to it) , and remove the etiological factor. This is called a lichenoid amalgam reaction.(10)

The first step of the treatment would be to remove the eventual etiological factor, and the lesion very often disappears .If after 3 months, we don't observe a disappearing or a reduction of the lesion we can proceed to biopsy. If the lesion is diffused, several areas of the lesion need to be biopsied. (3,4).

The histological and pathological features of Oral Epithelial Dysplasia (OED) and leukoplakia and erythroplakia are similar. In order to diagnose an OED, we must divide the mucosal site in architectural and cytologic characteristics : OED can be mild, moderate or severe, according to the involvement of less than one third, between one third and two thirds and more than two thirds of the mucosa, but without full thickness. (6)

The majority of leucoplakias are benign (80%), but the most likely to become malignant are the non homogeneous or the ones presenting reddish areas (80%) (10)

<table>
<tr><td colspan="4">Table 2 : Different clinical aspects of Leukoplakia</td></tr>
<tr><td colspan="3">NON HOMOGENEOUS (13)</td><td>HOMOGENEOUS (10)</td></tr>
<tr><td colspan="3">Erythroplakia and Proliferative verrucous leukoplakia are often a sign of potential malignancy : early detection improves prognosis (14)</td><td rowspan="2">Smooth
White
Well demarcated
More often asymptomatic</td></tr>
<tr><td><u>ERYTHROLEUKOPLAKIA</u></td><td><u>PROLIFERATIVE VERRUCOUS LEUKOPLAKIA</u></td><td><u>NODULAR LEUKOPLAKIA (10)</u></td></tr>
<tr><td>Association of :
- Ulcerative, erythematous lesions
- White plaque lesions
Indurated and painful
Might become malignant in 50% of the cases</td><td>Doesn’t present indurations
Multifocal aspect
Verrucous (wartlike aspects)
Important risk of malignancy
Can be linked with HPV
High reccurence tendency
More aggressive proliferation</td><td>White lesion with granulous aspect</td><td></td></tr>
</table>

1.3 Candida infections

C. Albicans is a fungi that is present in 30% to 50% of healthy subjects, at the level of mucous membranes of the ears, eyes, gastrointestinal tract, mouth, nose, and genital organs. (15)

A candida infection is an opportunistic infection due to an excessive growth of *Candida Albicans* in the oral cavity. 20% to 75% percent of patients are asymptomatic.(16).

The etiology of Candida infections is often related to the patient’s immune and endocrine condition. It can also be linked to medication or medical condition that suppress the natural immune system of the patient (1) (*Table 3*) .

Table 3 : Predisposing factors for Oral candidiasis and Candida associated lesions **(1,16)**	
Local Factors	**General factors**
- Denture wearing	- Immunosuppressive conditions
- Smoker patients	- Impaired health status
- Atopic constitution	- Immunosuppressive treatment
- Oral/Inhalation/Topical steroids	- Chemotherapy
- Hyperkeratosis	- Endocrine disease
- Imbalance in oral microflora	- Hematinic deficiencies
- Quality and quantity of secreted saliva	

We distinguish several groups of Oral Candidiasis:

1.3.1 : Pseudomembranous candidiasis :

In this type of candidiasis, we can find an acute and a chronic form. Both present the same clinical findings. (1)

The acute form, also called “Oral Thrush”, presents multiple creamy white patches on the oral mucosa, hard and soft palate and oropharynx (17). It is usually non painful (16). It is possible to wipe it off with a gauze, leaving an underlying erythematous mucosa (18).

The chronic form of candidiasis is mainly found in patients presenting HIV infections. (1) This can eventually lead to esophageal affectation, impeding proper swallowing and eating (17).

1.3.2 Erythematous candidiasis :

The erythematous form of Oral Candidiasis can present acute and chronic forms as well. The acute form is often due to a decrease of the amount of bacterial microflora after the intake of broad-spectrum antibiotic, which allows the overgrowth of Candida. Clinically, in acute and chronic forms, we may find red lesions on the oral mucosa. (17) The borders of the lesion are diffused, which allows us to differentiate it from

Erythroplakia. We mainly find it on the palate and on the dorsum of the tongue of patients that use inhaled steroids. (1)

1.3.3 Chronic hyperplasic candidiasis :

This form of Oral Candidiasis is characterized by a white non removable plaque, that we cannot differentiate from oral leukoplakia.(1) It is mostly located in the anterior buccal mucosa, close to the retro-commissural areas. It can also be found on the lateral part of the tongue. Chronic hyperplasic candidiasis can be associated with an risk of malignant transformation (10%) in OSCC. (17)

1.3.4 Candidiasis associated lesions :

Table 4 : Candidiasis associated lesions.

Median rhomboid glossitis	Denture stomatitis	Angular cheilitis
- Also called atrophic glossitis (17) - Presents a rhomboid area of atrophy and erythema on posterior tongue dorsum (17) - Associated with steroid inhalers or with tobacco (17) - Lesion presents a mixed microflora composed of bacteria and fungi (1)	- Mostly found in the palatal mucosa - Erythematous lesions on area that bears the removable prosthesis - Due to poorly fitting dentures, lack of hygiene and decrease of salivary flow that allow growth of Candida Albicans (17)	- Infection of the fissures of the commissure of the mouth, surrounded by red areas (1) - Crusting lesion (17) - Presence of S.Aureus and C.Albicans - Favored by a decrease of vertical dimension, or a commissural laxity which increases the exposure of the skin to saliva (10,16)

The diagnosis is done through clinical history and intra and extra oral examination. The sampling should be done through an active lesion, and the diagnosis can be confirmed through the obtention of a Pap smear test, with a sample of oral rinse, or by culture with Sabouraud dextrose agar (16)

Regarding its treatment, the management of the predisposing factors (steroids intake, chemotherapy or radiotherapy, decrease of salivary flow…) presents a really important role. Most of the candida infections have a good answer to topical antifungal medication like cream or ointment. (1,16)

However, if the patient presents immunosuppressive disorders, the topical treatment will not be efficient and we should administer a systemic treatment to ensure the disappearing of the lesion (for example Fluconazole in oral suspensions) (15)

1.4 Oral squamous cell carcinoma (OSCC)

A carcinoma is a malignant neoplasia constituted of epithelial cells, that are infiltrating the surrounding tissues and can later on produce metastases that are lesions which migrated further away from their original site. OSCC is originated from the surface of the stratified squamous epithelium and is the most frequent type of oral cancer (5,10)

The most common site to find it is the lateral part of the tongue. It can also be present in alveolar ridges, buccal mucosa, floor of the mouth, and upper jaw (19,20)

Several studies attested that the excessive consumption of tobacco, alcohol, exposure to environmental pollutants, HPV and nutrition deficiencies are important risk factors in the development of OSCC. Tobacco is composed of several carcinogens like nitrosamines, polycyclic aromatic hydrocarbons, nitroso diethanolamine, nitroso proline, and polonium. (1)

Important consumers of both alcohol and tobacco have more than 35 fold higher risk of developing a squamous cell carcinoma (21). The synergistic effect of alcohol and cigarette consumption involves a dehydration of the oral mucosa due to the alcohol and a susceptibility of mucosal permeability. Some enzymatic pathways have also been identified as key role in the synergistic effect of alcohol and tabaco on the oral tissues, which has consequences on the central nervous system. (13)

All types of alcohol are involved in the development of oral cancers, but some recent studies attest that beer and wine and associated with greater risks of cancer development than “hard liquors” (1)

Also, the consumption of Betel (Areca) nut is an important risk factor at the level of the Pacific-Asian population. It can be mixed with lime, and forms a quid. Some other elements such as gutkha and pan masala, chewed in Asian populations, have also been identified as carcinogenic elements (1,21)

In India, OSCC is the first most common cancer among men, and fourth most common among women. Other risk factors might include ageing, defective bucco-dental hygiene, or a diet poor in vegetables (21)

Clinically, the lesion presents a non healing mouth sore or ulcer, and a modification of the surface texture. The patient often self notices an abnormal lesion or mass, that can impedes proper oral essential functions like eating, chewing, speaking. Also, otalgia, difficult movement, oral bleeding, neck masses and weight loss are encountered in advanced stages of the disease. When the lesion is unilateral, it should alert the practitioner, meaning the lesion could be malignant, and he should biopsy it to confirm this hypothesis. (1) In OSCC, the lymph nodes that are the most involved in the lymphatic spread of the cancer are submandibular, digastric and upper cervical nodes mostly. (18)

Final diagnosis can be attested after histopathological analyze of the tissue that has been sampled during the biopsy. (5)

OSCC has a high morbidity and mortality rate if the diagnosis is done during late stage. Potentially malignant lesions of OSCC are lesions of the mucosa that have a high risk of becoming an OSCC. They can be detected during the routine clinical examination. Indeed, among potentially malignant lesions, 0.13 to 17.5% became malignant in a period of time between 1 to 10 years. Also, the 5 year survival rate when the dysplasia is localized ranges from 75 to 84 % whereas the 5 year survival rate with distant metastases is at 20 % for a floor of the mouth carcinoma, and 36 % for a tongue carcinoma. (22) Nodal involvement is linked to a bad outcome in OSCC, and is one of the main independent prognosis factors in head and neck cancers (23)

The prevention plays a key role in the treatment of this condition, and early diagnosis can clearly ameliorate the outcome of OSCC. Typical potentially malignant lesions that could lead to OSCC are white/red patches (22)

The first objective of the management of the OSCC would be to remove any atypical epithelium and avoid the development of any dysplasia. Actually, no trustable method has been established to monitor accurately the risk of evolution of a potentially malignant lesions. Therefore the monitoring of a potentially malignant lesion requires very important health care resource and the patient's investment. (22)

Some recent studies reveal a modification in the epidemiology of OSCC. In the United States, OSCC have decreased during past years (5,24). This is linked to a decrease in the prevalence of the most important risk factors, that are smoking and alcohol intake. Nevertheless, the incidence of Oral tongue Squamous Cell carcinoma have raised, but the reasons of this increase haven't been identified yet. (5)

Cancers belongs to the five leading causes of death worldwide actually. 5% of cancers are found in the head and neck region, and almost half of these are encountered in the oral cavity, which gives the dentists an important responsibility. (25) Men are two times more affected than woman, and age is also an important risk factor of developing oral cancer. (26)

In 2013, the WHO stated that the survivance of oropharyngeal cancer after one year is of 84%. After five years it decreases at 62% and after ten years at 51 %. This enhances the priority of early diagnosis. (27).

1.5 Diagnostic tools

Despite the fact that the oral cavity is an easily accessible site for examination, a lot of cases of cancer are detected at a late stage. Dentists attribute the lack of efficiency in their oral examination to a lack of formation and clinical exercise during their undergraduate course. (28) Oral potentially malignant disorders can have several clinical manifestations, and a proper diagnosis technique can make the risk assessment evaluation easier for the practitioner. (29) In order to avoid misdiagnosis, dentists should undergo a constant up to date training, in order to recognize and differentiate accurately potentially malignant and malignant lesions at the earliest time possible, and improve the outcome of a potential oncologic treatment.(4) .

1.5.1 Medical history

Assessing a complete medical history is the first essential step of all patient care. It will first allow to determine the chief complaint of the patient, registering all details linked to this complaint, gather past or current information about eventual health conditions. It can also help to evaluate the impact of the systemic health of the patient on the oral

cavity, and on the opposite, help to detect underlying conditions that could have some oral manifestations. (1)

It also indicates the patient's current intake of medication, and helps assessing the overall health state of the family to target any possible genetic or hereditary disorder. The distribution of a complete health questionnaire should be done, and examined carefully before each first appointment. However, the patient isn't always inclined to provide an accurate and complete report of his medical and dental status. In this sense, a dentist should always refer to the patient's physician. (1)

1.5.2 Clinical examination

The clinical examination is the second step of the examination of the patient. This exam has to be carried out at least once a year. (1) Dentists should include the conventional visual and tactile examination (CVTE) in their clinical exam routine. It needs to be done intra orally and extra orally, after the medical, dental and social history has been assessed. It includes examination of the face by palpation and auscultation of exposed skin, lip, mouth tissue with correct white lightening. The dentist should ask for any symptoms such as globus sensation (presence of a lump in the throat), unusual pain at the level of the ear or oropharynx, or hoarseness. Lymph nodes and neck should be therefore carefully exanimated. The encountry of an oral lesion in the oral cavity leads to presence the of equivalent lesions on oral mucosa, and also be linked to an enlargement of lymph nodes (1,5)

If a lesion is encountered, the dentist should describe it precisely, and assess if it is normal, a variant of a normal lesion or a diseased lesion. (10)

1.5.3 Differential diagnosis and Final diagnosis

Once a potential diagnosis has been established, the dentist needs to identify a differential diagnosis. A list of similar lesions must be assessed , taking into account the medical history, and clinical examination of the patient. This will allow the him to know which complementary tests he should do, like biopsies, blood count, or imaging tests. (1,10)

A biopsy is done in order to detect any kind of dysplasia on suspicious lesions or pre malignant lesions. It is a surgical technique performed with a scalpel, that will allow to proceed to an histopathological examination, and therefore guide the dentist in the establishment of a final diagnosis. The biopsy can either be incisional, meaning that only a part of the pre malignant lesion will be sampled, or excisional, meaning that the totality of the abnormal mucosa is removed. (5)

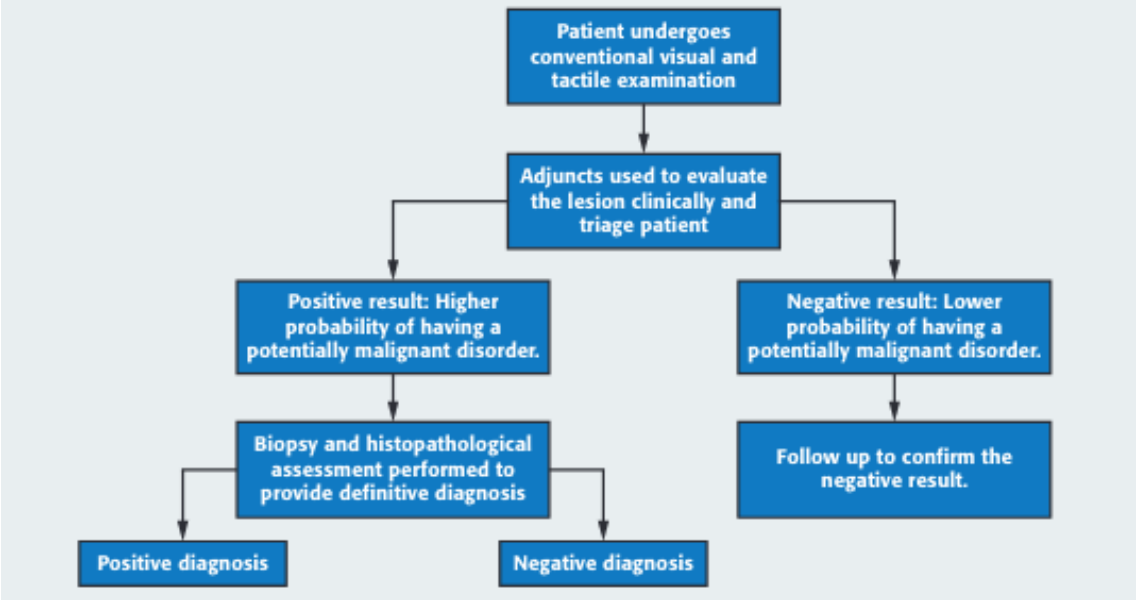

Figure 1 : Complementary tools to assess the need of a biopsy (5)

1.5.4 Clinical recommendations and patient management

The objective of a good management of patient with oral pre malignant diseases (OPMD) or oral cancers such as OSCC is to reduce the patient's mortality and morbidity, and improve their quality of life. Therefore, the risk of each lesion has to be stratified in order to improve the management. To do so, the histopathological results of the biopsy must be studied. The risk factors have to be assessed as well, in order to detect which can be avoidable like smoking, poor diet or alcohol intake. Finally , the clinical examination is a very important tool for risk stratification. (30)

1.6 Justification

Some researchers have already been done in Europe, America, Australia and Middle east, and prove that dental surgeons lack of knowledge considering the risk factors, typical clinical features and diagnostic tools regarding oral cancerous and potentially malignant lesions. They also need more education regarding how to address those type of patients to specialists.

The aim of this study is therefore to asses if a selected sample of dentists own the theoretical foundations allowing them to establish a pertinent diagnosis, at the earliest stage of the disease.

2. OBJECTIVES

- The main objective is to describe current practice, and knowledge of dentists regarding oral lesions and oral cancer screening
- The secondary objective is to measure differences of knowledge and attitude regarding specialty, when facing a patient presenting oral lesion.

Hypothesis : According to the studies that have been already done, dentists possess average knowledge about oral medicine that needs significant improvement.

3. MATERIAL AND METHODS

Study design:

This multi- country cross sectional study is based on a questionnaire handled to dental surgeons actively practicing dentistry especially in Spain and in France. The purpose of the investigation has been explained prior to the questionnaire. It received ethical approval from the Ethics Committee of Investigation of the Universidad Europea (Project CIPI/ 22.038). Dental surgeons based their participation on their free will, and comprehensive explanations about the study and its purpose have been communicated, preceding the questionnaire.

Questionnaire:

The questionnaire used in this study was firstly designed in Spanish and translated in English for non Spanish speakers. The questionnaire was self explanatory, anonymous, with close ended questions, and was done between october 2022 and march 2023.

The first four questions are about personal and professional data. Then, 14 questions about precancerous and cancerous lesions are asked, each of them containing four possible answers, with only one correct. Six of them concern Oral Lichen Planus : Its clinical aspects, etiology, general characteristics, dysplastic condition and percentage of OLP susceptible to undergo a malignant transformation. Then, questions about Leukoplakia are asked: where can it be most commonly found, conditions linked to it (diseases or viruses) and question about its dysplastic potential. Then questions about Candida infections, Angular cheilitis and Oral Squamous Cell Carcinoma are asked.

The validity of the content of the questionnaire has be evaluated priorly by a group of experts in oral medicine, and participants are advised to do the questionnaire by themselves, without any exterior help.

Statistics and Data analysis:

The collected data has been stored in an Excel sheet. The personal data answers are quantitative variable and qualitative variables as well. The questions concerning oral lesions are qualitative variables.

4. RESULTS

A cross sectional study was performed over a total of 52 subjects, all graduated from dentistry. Their aged ranged between 25 and 80 years old, and 59.6 % were women. There are specialized in orthodontics, implantology and oral surgery, esthetic dentistry, Pediatric dentistry, Periodontics, Endodontics, and General dentistry

They had to answer 17 questions.

Here are the answers for each question of the survey

- **For the question 1 : "Which of the following could be an oral manifestation of lichen planus"**

47 persons among 52 (90.3%) had the right answer " White radiating lines on the buccal mucosa". 3 persons (5.7%) answered that lichen planus is a well demarcated lesion 2 persons (3.8 %) answered that it doesn't present any post inflammatory pigmentation. No one answered that lichen planus can be scrapped off

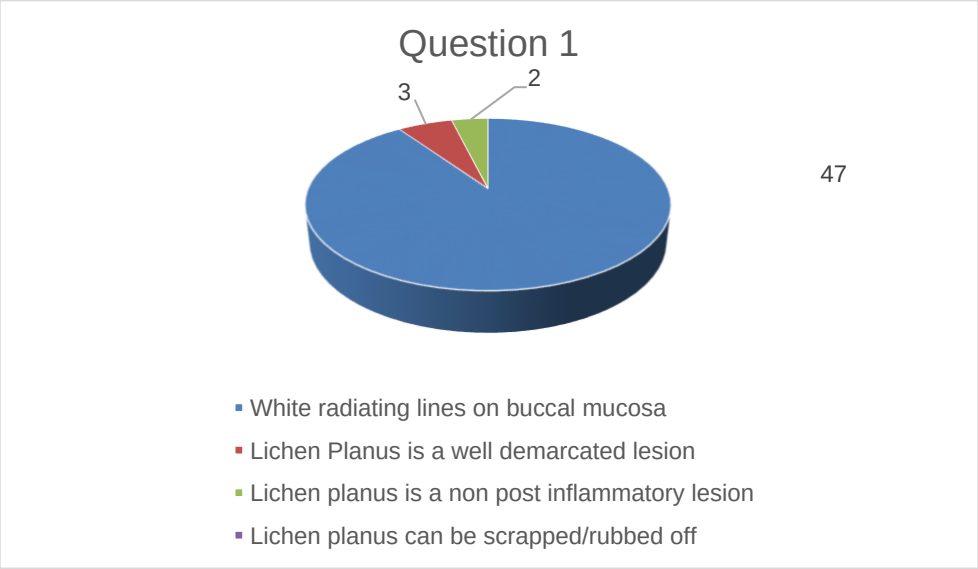

Figure 2 : Result diagram of question 1 "Which of the following could be an oral manifestation of lichen planus"

- **For the question 2 : “lichen planus…”**

  No one answered “has to be surgically removed”. 14 persons answered “can only be treated by medication”. 37 answered right, saying that it “can undergo malignant transformation. 1 person answered “affects men twice as much compared to woman”

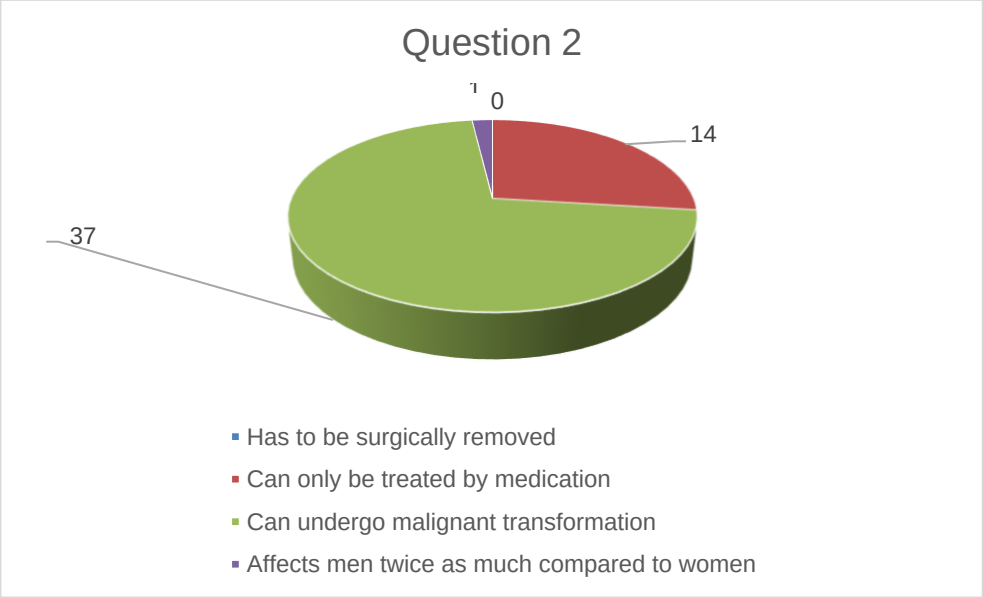

Figure 3 : Results diagram of question 2 “lichen planus…”

- **For question 3 : “Oral Lichen Planus could be…”**

  30 persons answered the right answer which is “asymptomatic”, 13 answered “Tobacco cigarette related”, 8 answered “mostly unilateral”, and 1 answered “always presents erythematous areas”.

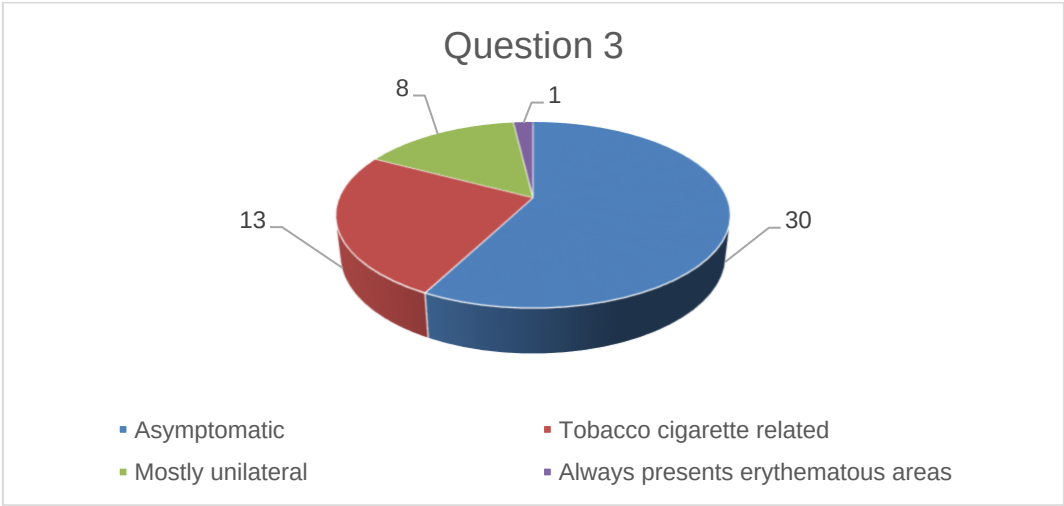

Figure 4 : Result diagram of question 3 “Oral Lichen Planus could be…”

- **For question 4 : “Which of the following is usually related to oral hairy leukoplakia” :**

  4 participants answered “Coxsackie virus”, 17 answered “Human Papillomavirus”, 3 answered “Herpes Simplex Virus” and 28 answered correctly “Epstein Barr Virus”

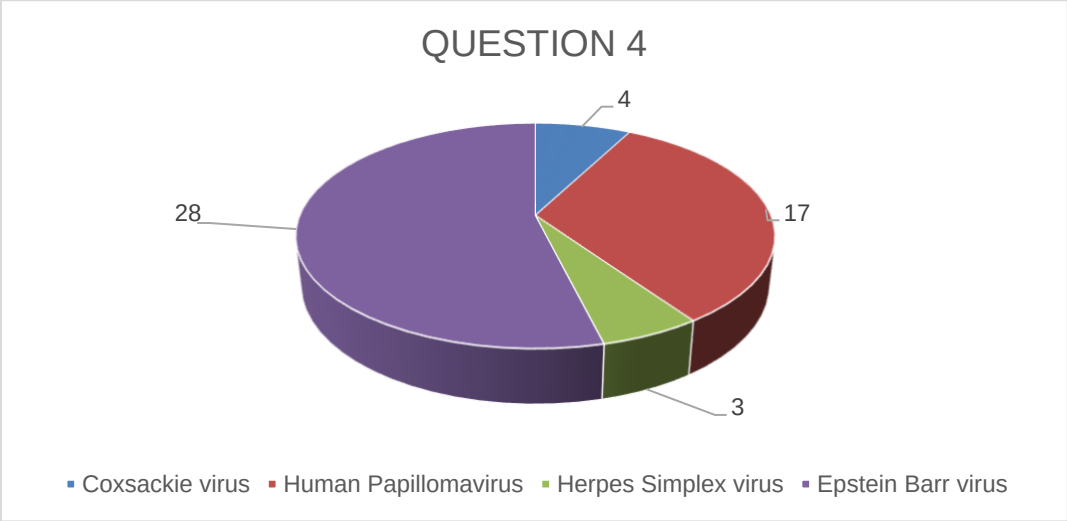

Figure 5 : Results diagram of question 4 “Which of the following is usually related to oral hairy leukoplakia”

- **For question 5 : “Where does Leukoplakia have a greater risk comparatively to other sites ? “**

21 participants answered “tongue”, 22 participants answered correctly “Floor of the mouth”, 1 participant answered gingiva and 8 participants answered “Buccal Mucosa”.

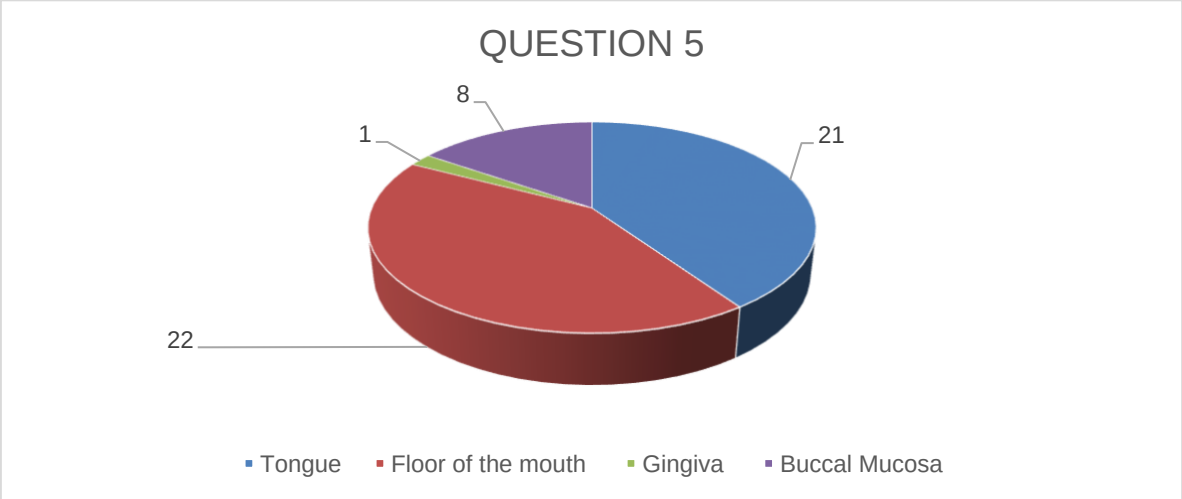

Figure 6 : Results diagram of question 5 “Where does Leukoplakia have a greater risk comparatively to other sites ? “

- **For question 6 : “ In which disease Oral Hairy Leukoplakia is mainly seen?”**

  2 participants answered “Multiple sclerosis”, 3 participants answered “Crohn’s disease”, 36 participants answered correctly “HIV” and 11 participants answered Candidiasis.

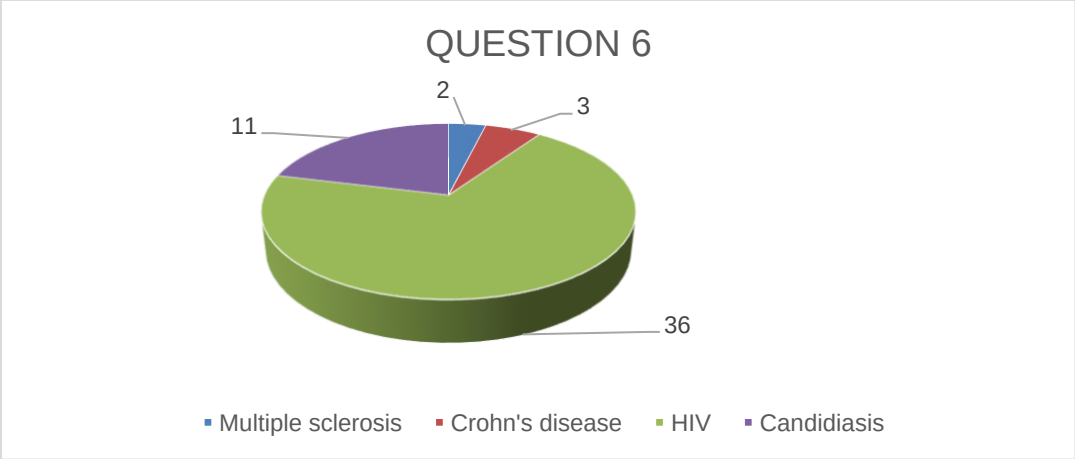

Figure 7: Results diagram of question 6 “ In which disease Oral Hairy Leukoplakia is mainly seen?”

- **For question 7 : “Which one is the most predisposed to undergo a malignant transformation ?”**

2 participants answered “Homogeneous Leukoplakia” , 6 participants answered “Candida Leukoplakia” , 5 participants answered “Leukoedema”, and 39 had the correct answer “Proliferative verrucous leukoplakia”

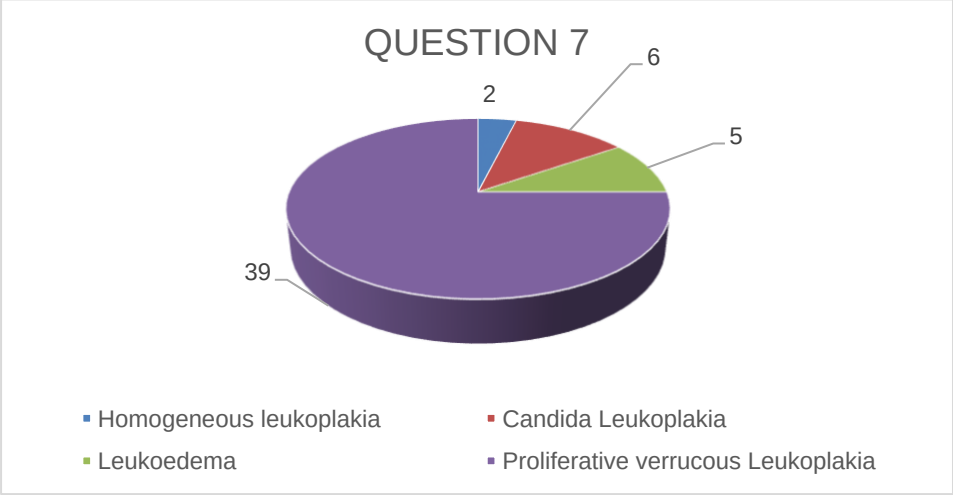

Figure 8: Results diagram of question 7 “Which one is the most predisposed to undergo a malignant transformation ?”

- **For question 8 : “ Candida infection is not seen in..?”**

5 participants answered “Median Rhomboid Glossitis””, 36 participants answered correctly “geographic tongue”, 6 participants answered “oral trush”, and 5 answered “Denture Stomatitis”

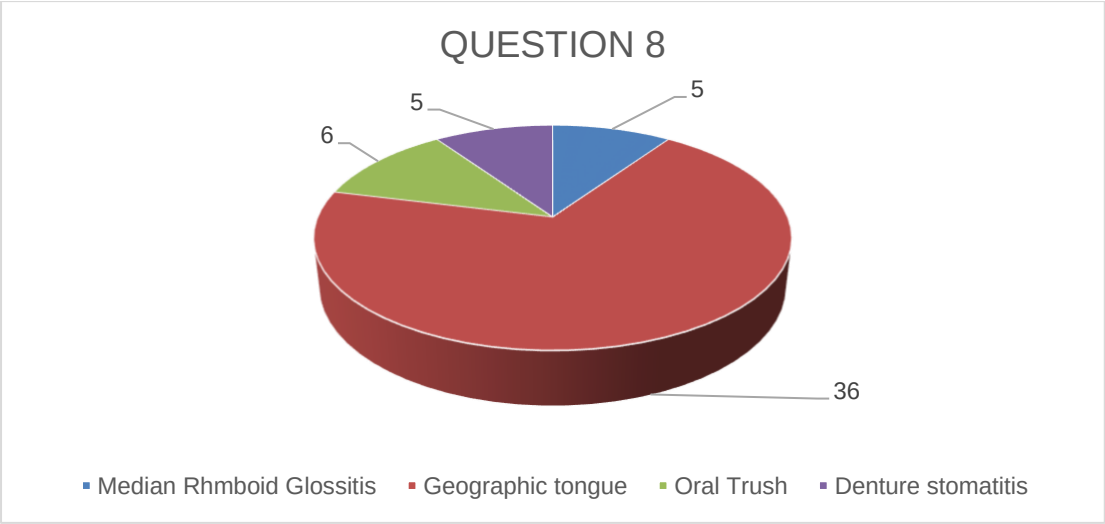

Figure 9: Results diagram of question 8 " Candida infection is not seen in..?"

- **For question 9 "A patient on oral penicillin presents white lesions on the tongue that can be scrapped away, leaving a red surface. This patient probably has :"**

  1 participant answered Lichen planus, 4 answered "Mucosal Dysplasia", no one answered "Leukoedema", and 47 answered "Candidiasis", which was the correct answer.

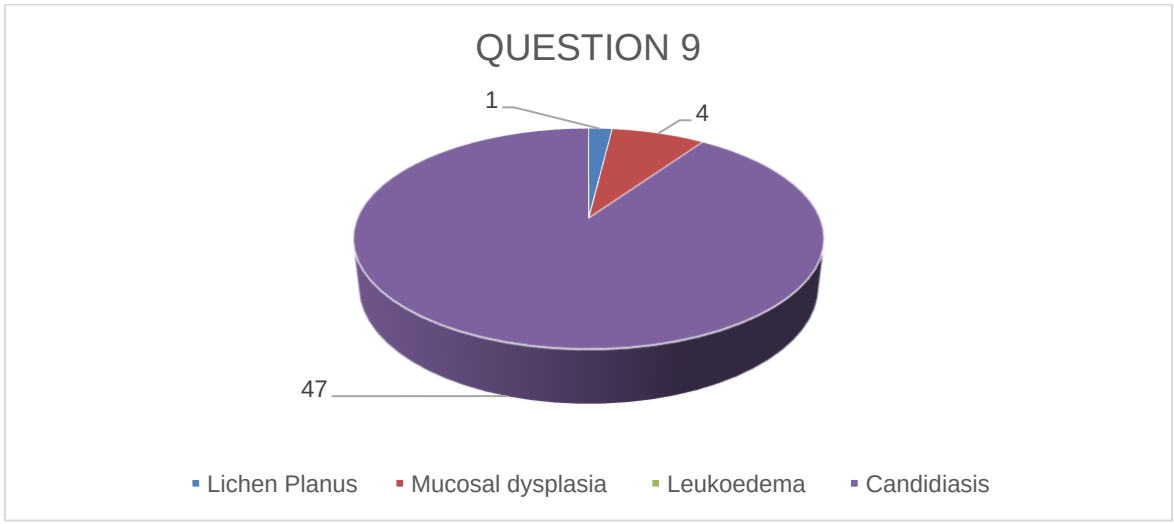

Figure 10: Results diagram of question 9 "A patient on oral penicillin presents white lesions on the tongue that can be scrapped away, leaving a red surface. This patient probably has :"

- **For question 10 : The Angular Cheilitis is related to …"**

2 participants answered "Tuberculosis" , 6 participants answered "Cytomegalovirus" , 10 participants answered "Human Papillomavirus" , and 34 answered correctly "Candida Albicans"

Figure 11: Results diagram of question 10 "The Angular Cheilitis is related to …"

- **For question 11 : "Most common sites of oral squamous cell carcinoma is …"**

  8 participants answered "Floor of the mouth", 5 answered "Gingiva", 9 answered "Buccal Mucosa", and 30 answered correctly "Lateral Border of the tongue"

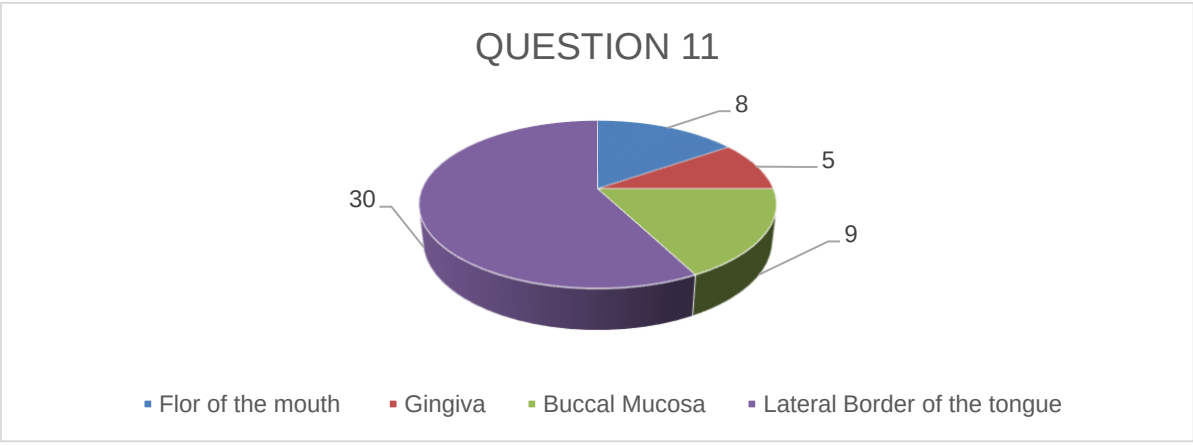

Figure 12: Results diagram of question 11 "Most common sites of oral squamous cell carcinoma is …"

- **For question 12 : "Main etiological factor of Oral lichen Planus has been identified as " :**

  31 participants answered "Prolonged emotional stress", 10 answered "Trauma", 6 answered "age" and 5 answered correctly "Hereditary".

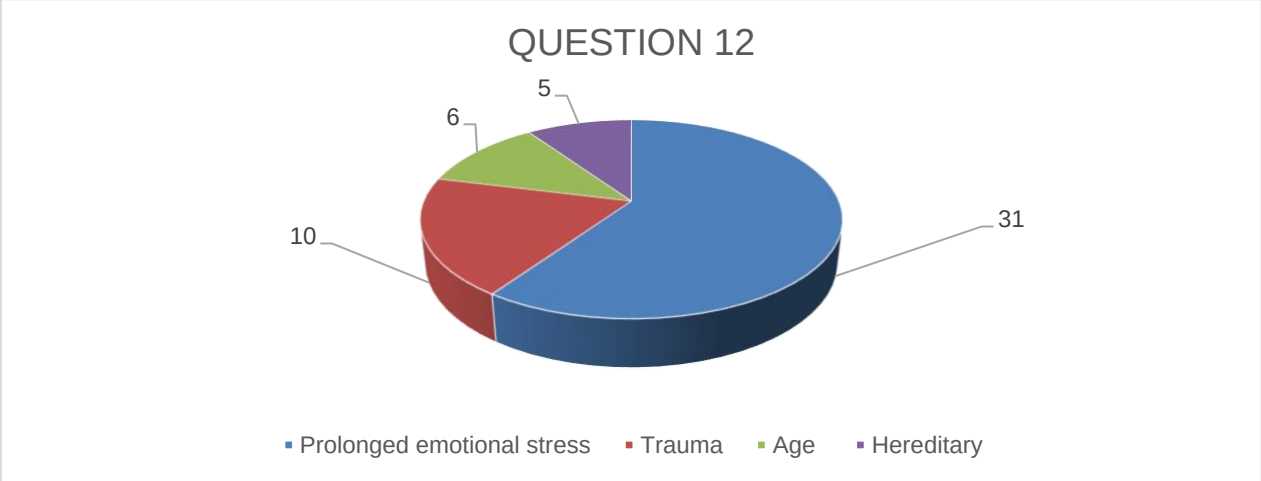

Figure 13: Results diagram of question 12 "Main etiological factor of Oral lichen Planus has been identified as "

- **For question 13 : "WHO considers Oral Lichen Planus as a …" :**

  39 participants answered correctly "Premalignant condition", 1 participant answered "Malignant condition", 1 answered " Hereditary condition" and 11 answered "Psychosomatic condition".

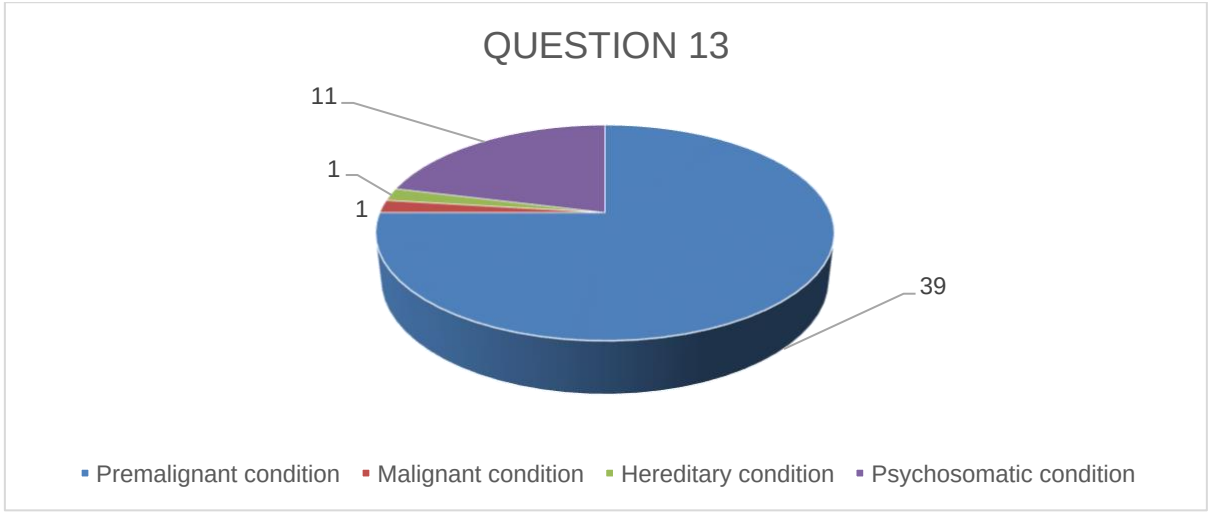

Figure 14: Results diagram of question 13 "WHO considers Oral Lichen Planus as a …" :

- **For question 14 : “Dysplastic transformation is reported to occur in what percent of cases of lichen planus ? “ :**

  11 participants answered “5.5%”, 14 participants answered correctly “3.7%” , 20 participants answered “2.5%”, and 7 answered “15%”

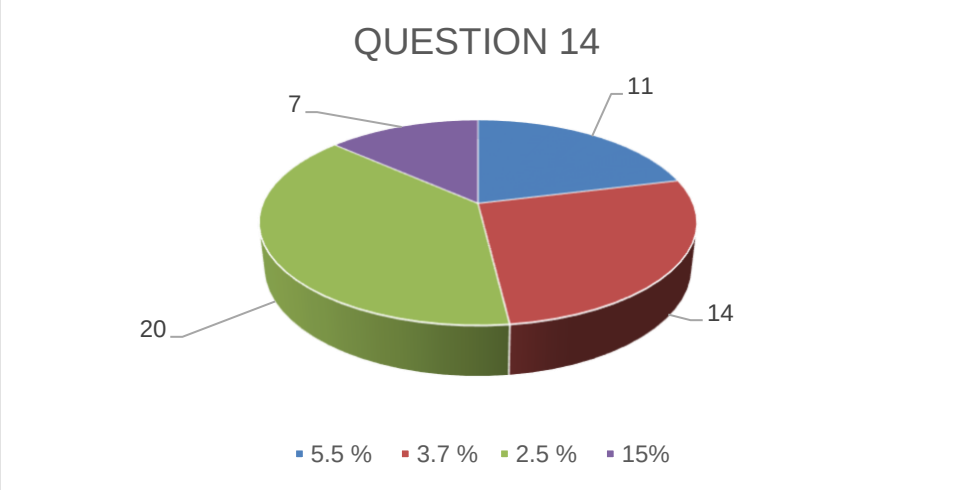

Figure 15: Results diagram of question 14 “Dysplastic transformation is reported to occur in what percent of cases of lichen planus ? “

Table 5 : Results of the investigation classified by specialization field.

Field	Number of answers	Mean of correct answers
General dentistry	28	7.3/14
Esthetic dentistry	2	7.5/14
Pediatric dentistry	4	8.5/14
Implantology and oral surgery	10	8.7/14
Orthodontics	3	9/14
Endodontics	3	10/14
Periodontics	2	11/14

In this table, we can see that the field that is the most qualified in oral medicine regarding our questionnaire is Periodontics dentistry, with a mean of 11 good answers on 14 questions. The field that has the smaller number of good answers is general dentistry, with a mean of 7.3 good answers on 14 questions asked. However, the sample of dentists specialized in general dentistry is more representative than the one of Periodontic dentistry, because the number of participants is more important.

5. DISCUSSION

The aim of the study was to assess the level of knowledge of dentists regarding the most important oral lesions. A sample of 52 dentists answered to our questionnaire.

In our 14-item questionnaire, the average of right answers was 8.8/14. In a study conducted in America, the level of knowledge of dentists after a questionnaire of 15 questions on oral cancer ranged from 6.22 to 8.53(25), which is similar to what we found in our research.

In our study 90.3 % of the participants agreed on the fact that OLP is characterized by White radiating lines on the buccal mucosa, and 71.1 % attested that it can undergo malignant transformations. Also,74.88% considered OLP as a pre malignant condition, regarding the WHO definition. Furthermore, only 26.88% of our participants found the correct amount of OLP that could undergo dysplasia (3.7%). In a study performed in a sample of dentists in Netherlands, 93% attested that it is a potentially malignant lesion. (32) On another study conducted in Iran, only 3.9% of the dentists were able to identify the most common type of potential malignant OLP (33)

Indeed, OLP is a pre malignant lesion, and the early monitoring would help to anticipate the development of an OSCC, and positively influence the prognosis, by raising the survival rate (34) .A long term follow up every 6 months is crucial in order to be able to detect malignant evolution (11). Various biomarkers could help in the early detection of a pre malignant lesion, such as modulators of apoptosis like p53 protein, cell cycle regulators like p16 or inflammation related factors like TNF α, or IL-6. (7)

In our study, 57.6 % consider that OLP is asymptomatic, and 59.62 wrongly linked its appearance to emotional stress, whereas it is triggered by hereditary factors (attested by only 9.6% of the participants of our study).

Regarding Oral Hairy Leukoplakia, 32.6% of the participants wrongly linked it to Human Papillomavirus. 53,84 % linked it correctly to Epstein Barr Virus". 69.12 % agreed that HIV could be linked to Oral Hairy Leukoplakia. Therefore, dentists are aware that Oral Hairy Leukoplakia can develop in immunocompromised patients like carriers of HIV, and are able to recognize the virus responsible for the lesion. The fact that a part of the

participants is not sure about the etiology of the virus causing Oral Hairy Leukoplakia impedes them to ask important questions during the anamnesis, like the presence of signs (ex: blood tests) that could guide them to detect the presence of this virus, allowing them to establish a presumptive diagnosis about the lesion.

Considering the evolution of leukoplakia into a malignant lesion, 42.3 % of our participants agreed that it could happen more on the floor of the mouth than on other sites. The location that was also often wrongly considered as most important location for malignant evolution is the tongue with 40.38% of the participant's answer. More generally, in a study performed by Bassel Tarakji among 303 dentists working in Saudi Arabia, practitioners consider that if we found an oral potentially malignant disorder at the lateral surface of the tongue, it was the most susceptible site for it to undergo a malignant transformation. (35) In another research conducted by Bsoul and Al, 30% of head and neck cancerous lesions were found on the tongue, and then on the floor of the mouth. (36)

According to this information, it is extremely important to assess carefully the type of lesion encountered and its location in the oral cavity in order to predict its evolution, and optimize an early management. Indeed, the dentist should give the same attention to an oral abscess as a precursor oral lesion, because a good assessment could detect a cancer in Stage I or Stage II , and the prognosis would be drastically improved (22)

It is believed, in consonance to our study, that the proliferative verrucous leukoplakia was the most predisposed to undergo a malignant transformation (74.88% of participants answer). Parashar declared that proliferative verrucous leukoplakia is a multifocal form of progressive leukoplakia and has a important risk or malignant evolution. This means that dentists are educated regarding this point. (35) In Yemen, a previous study attested that 87% reported that leukoplakia and erythroplakia were Oral Premalignant diseases, and a study done in Ireland showed that 80% of dentists designed erythroplakia and leukoplakia as the most pre malignant oral disorders (37). It seems therefore that depending on the sample of dentists studied, there can be a different level of awareness among them regarding Leukoplakia.

Regarding the most common site of OSCC, more than half of our participants (57.6%) acknowledge that it is located on the lateral border of the tongue, and a few attested that it was located on the floor of the mouth (15.36%). In Kuwait, Yemen and Iran, the majority of the dentists agreed that the floor of the mouth and tongue have the most important risk of cancer development (27) Comparatively, in a study done in Ireland, 86% identified floor of the mouth and 73% identified tongue as high risk areas for oral carcinomas. (37)

According to our research, the dentists lack significant knowledge nowadays about oral medicine. Hense, they struggle anticipating the evolution of an oral lesion into a potential dysplasia, and have difficulties assessing the risk factors of certain oral lesions, like Oral lichen Planus or Oral hairy leukoplakia. The study also reports that their knowledge regarding the main location of certain lesions like Leukoplakia or OSCC can be limited.

When we observe the average of right answers regarding their field of specialty, Periodontists and Endodontists seem to be more alert about oral medicine. General dentists present a bigger lack of education regarding those topics.

Some limitations of our study should also be mentioned, because the sample selection was based on the free will of the dentists: therefore, there could be a bias in the sense that the dentists who participated were interested in the study. Consequently, the sample is not fully representative of the whole dental population, across all specialty's fields, either in Spain or in France.

It is considered that the adoption of measures of prevention in the dentist's regular clinical practice can indicate awareness in oral medicine and its importance. Thus, it means that the practitioner is aware of potential risk factors, and raises the concerns among their patients and participate in health promotion education among general population. For example, the prevention that is made regarding cessation of tobacco consumption is crucial, since the risk of oral cancer development is 7 to 10 times higher among smokers. On the other hand, raising awareness among alcohol intake is also a key factor in the preservation of population's health. The difficulties regarding the diagnosis and management of oral lesions rely on the limitations of the theoretical

instruction and practicing in oral medicine. In certain studies, more than half of dentists are reticent on performing a biopsy and estimate that they are not trained enough to diagnoses and manage oral cancer.(34)

Some studies done In Brazil (28) showed that continuing educational activities regarding oral medicine encouraged the dentists to perform a regular mucosal examination, and were able to ameliorate their ability to detect oral lesions and cancers. Indeed, if their experience in oral medicine is important enough, they will practice active screening, which will be determinant in the finding of oral lesions. In this study, it is said that 88.9% of dentists that identified oral lesions are those that attended continuing educational activities. The majority of dentists that assisted to those formations are the one that show interest in the field of oral medicine. If the practitioner isn't interested in this field, he will tend to refer the patient to another specialist. The inconvenient in this case is that the few specialists available tend to be overburdened, and that can delay the diagnosis, and therefore the early management of the patient. The only dentists that feel confident enough to manage those cases are the one that received a proper education in this field, especially after their graduation. (28)

Other researches show that the more time passes after the dentist's graduation, the less awareness regarding oral lesions they have. This is why a regular up to date regarding their knowledge must be assessed (25)

Nowadays, our society is confronted to different challenges, like for instance the aging of the overall population. Those patients often live with multiple chronic diseases and comorbidities, went through complicated surgical procedures, and are taking various type of medication. It has been demonstrated that periodontal and oral diseases can be linked with systemic diseases .Therefore, the knowledge of their attending health care professional in general and oral medicine should be constantly updated. (1,38)

Technological advances allow us now to share information among clinicians worldwide, and provide relevant information that can be clinically used. The use of computed tomography or magnetic resonance imaging, allows us to collect precise clinical information , but also requires skilled professionals in order to use and to interpret it. (1)

6. CONCLUSION

- We recorded 58.63 % of correct answers across the entire study, which is not a sufficient result. It represents more than 40% of wrong answers to our questionnaire, which shows that a big sample of dentist's lack of knowledge regarding key points of oral medicine.

- Periodontists and Endodontists are most educated regarding these topics. General dentists have the poorest mean of good answers. This presents a very important problem because the general dentists are the first ones that can encounter some oral lesions and that can provide the earliest management for those patients, and should therefore be more aware.

- It would have been more precise if we recorded the same number of participants answer in every specialty that was interviewed.

- Awareness needs to be raised concerning the potential of malignancy of certain lesions, according to their type and their location.

- Dentists tend to be confused regarding the etiology of certain conditions, meaning that the management and follow up can be wrongly assessed.

- It's necessary to do researches across multiple countries could help authorities to elaborate standards criteria of continuing education and referral guidelines in order to motivate dentists and dental staff, sensibilize them consistently and regularly on those topics, and improve the overall management and prognosis of patients presenting those lesions.

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8. ANNEXES :

Figure 15: Results diagram of question 14 “Dysplastic transformation is reported to occur in what percent of cases of lichen planus ? “	Page 25