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Major considerations of the dentist in the diagnosis and treatment of oral cancer in hospitals: a systematic review

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Highlights

- ✓ The lack of effective policies regarding the maintenance of oral health in hospitals contributes to the increase of systemic diseases and damage to the health of patients.
- ✓ The dentist plays a key role in diagnosing, planning and conducting interdisciplinary clinical approaches focused on the quality of life of these patients.
- ✓ Anamnesis and detailed clinical examination are essential for the prevention and treatment of oral cancer (OC).
- ✓ Basic knowledge in oral pathology is a requirement for all dental surgeons, as well as being always attentive to the detailed clinical examination.
- ✓ Performing biopsies whenever you notice tissue changes with more than 15 days that have not healed.
- ✓ OC represents the 6th most common cancer in the world, with about 90% being represented by squamous cell carcinoma, and 10% represented by mesenchymal neoplasms (malignant neoplasm of cartilage tissue and salivary glands).
- ✓ The prevention of OC depends mainly on the elimination of risk factors involved in its etiopathogenesis.
- ✓ Every dental surgeon should emphasize and clarify the importance of patient self-examination.
- ✓ The main epigenetic causes are tobacco, alcohol, and poor oral hygiene.

Abstract

Introduction: Contemporary dental care must be comprehensive, aimed not only at dental treatment but also at assessing the patient's health status. Dentistry is of paramount importance in preventive actions against cancer in hospitals, given that oral cancers (OC) have a frequency of approximately 90% of cases in hospitals. **Objective:** It was to present, through a systematic review, the importance of the dental surgeon in the early diagnosis and prevention of oral cancer in the hospital environment. **Methods:** The present study followed a systematic review model, following the rules of systematic review – PRISMA. The search strategy was performed in the PubMed, Cochrane Library, Web of Science and Scopus, and Google Scholar databases. The quality of the studies was based on the GRADE instrument and the risk of bias was analyzed according to the Cochrane instrument. **Results and Conclusion:** A total of 118 articles were found. A total of 67 articles were fully evaluated and 38 were included in this study. Based on the objective of the present study and on the literary findings, it became evident that the elaboration of the work by dentists in hospitals can enable early and effective treatment of patients with oral cancer. It also made it possible to discuss dentistry in general, address dental care in the hospital environment, and highlight the difficulties faced in its insertion in hospitals. It is necessary to train and train the entire hospital team and the dental surgeon so that oral health is offered to patients, as well as to know the impact caused by oral problems on the systemic health of patients and implement specific protocols on the subject in all hospital aspects. The dentist must promote the general health of the hospitalized individual, based on interdisciplinary planning developed together with other health professionals, as well as assess the main needs of the patient and contribute to the quality of life of these individuals.

Keywords: Oral cancer. Neoplasms. Hospital dentistry. Early care. Hospital care.

Introduction

Contemporary dental care must be comprehensive, aimed not only at dental treatment but also at assessing the patient's health status. Dentistry is of paramount importance in preventive actions against cancer in hospitals, as well as in the elimination of inflammatory, infectious and painful symptomatological processes that may contribute to the loss of hospitalized patients [1]. It is associated with systemic conditions in hospital environments and overcomes the barriers and prejudices faced by those involved in this specific type of health service. In this sense, Hospital Dentistry has acquired its importance in the multi-professional health team, which is essential for the therapy and quality of life of hospitalized patients [2].

In this scenario, it is possible to perceive the growth in the number of patients who need dental procedures in hospital environments, a fact that requires the effective presence of the dentist in multidisciplinary activities and favors an important review of professional opportunities and areas of activity [3].

Hospital dentistry can be defined as a practice that aims to take care of oral changes that require procedures from the multidisciplinary team, working with health professionals involved in the treatment, and integrally approaching the patient. For several years, dentistry has focused especially on clinical dental care. However, with the advancement of technology and consequently the computerization of all health sectors and the need for joint care with other health professionals [4].

Pain relief in patients with neoplasms and the adequacy of oral conditions should be considered a priority for the dentist. However, the effective participation of dentists is not a reality in the hospital environment in Brazil and their work is still very limited because they are not part of the hospital. A multidisciplinary patient care team is also needed to clarify how the dentist can contribute to improving the quality of life and systemic conditions of hospitalized patients [5,6].

In this context, oral cancers (OC) have a frequency of approximately 90% of cases in hospitals [7,8]. It is estimated that more than 400,000 new cases of oral cancer are diagnosed worldwide each year [7,9]. Odontomas are tumors of odontogenic origin, also considered developmental anomalies (hamartomas) of epithelial origin. They represent on average 70% of all odontogenic tumors found [7].

Despite this, OCs can be preventable, once risk factors are identified and treated, such as tobacco use and alcohol consumption are behaviors that increase the likelihood of the disease. Thus, the anticipation of the diagnosis begins with the identification of potentially malignant lesions of the oral mucosa and inflammatory processes [10]. In this sense, clinical-hospital recognition and evaluation of oral mucosa lesions can detect up to 99% of cancers. According to the WHO, surgical biopsy remains the gold standard for the diagnosis of oral cancer [10].

In this scenario, oral cancer can be easily detected through relatively simple tests. The visualization of the OC is facilitated by the anatomical characteristics and the location of the oral cavity, to dispense with the use of instruments of high technological complexity and hardly cause discomfort to the patient. Therefore, the importance of professional awareness for early diagnosis and the correct direction for treatment [11,12].

In this aspect, the areas that suffer most from the disease are the tongue, specifically the posterior lateral border, floor of the mouth, gingiva, mucosa, tonsils, retromolar region, dorsum of the tongue, soft palate, and hard palate [11]. The survival rate of early diagnosis in the early stages ranges from 53% to 68%, while the diagnosis of advanced cancer is approximately 41% and 27% and in the late stage, it is regrettably 70 to 80% [12].

In this scenario, about 95% of OC cases are squamous cell carcinoma (SCC), in which affects the most common sites of this pathology are the tongue (26%) and the lower lip (23%) [13,14]. In this aspect, the dentist is the health professional who has an important role in the actions and a strategic role [14].

Thus, the present study aimed to present, through a systematic review, the importance of the dental surgeon in the early diagnosis and prevention of oral cancer in the hospital environment.

Methods

Study Design

The present study followed a systematic review model, following the rules of systematic review - PRISMA (Transparent reporting of systematic review and meta-analysis, access available in: http://www.prisma-statement.org/).

Data Sources

The search strategy was performed in the PubMed, Cochrane Library, Web of Science and Scopus, and Google Scholar databases. The present study was carried out from January to March 2022.

Descriptors (MeSH Terms)

The main descriptors (MeSH Terms) used were "*Oral cancer. Neoplasms. Hospital dentistry. Early care. Hospital care*". For greater specification, the description "*Cancer and Hospital Dental Surgeon*" for refinement was added during the searches, following the rules of the word PICOS (Patient; Intervention; Control; Outcomes; Study Design).

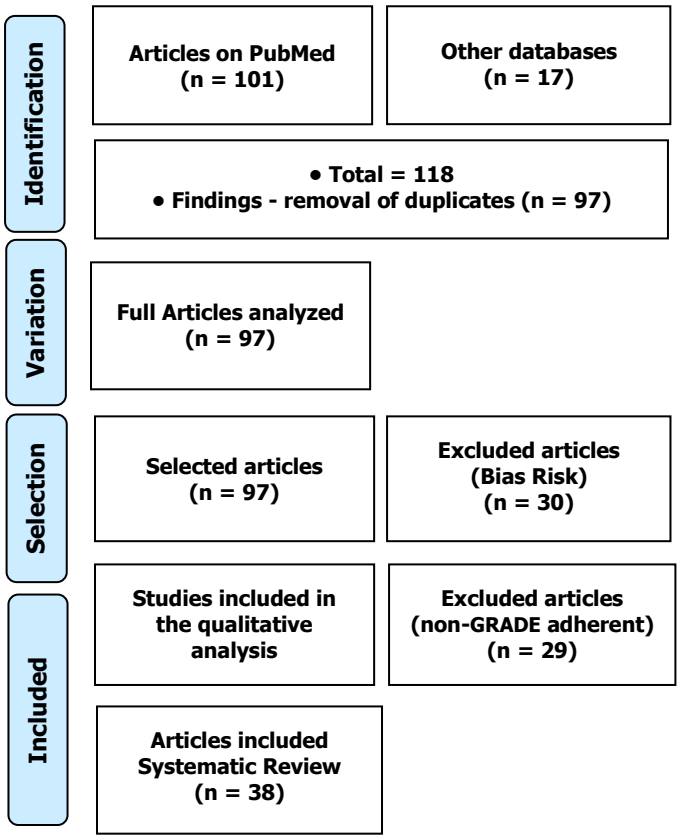
Selection of studies and risk of bias in each study

Two independent reviewers (1 and 2) performed research and study selection. Data extraction was performed by reviewer 1 and fully reviewed by reviewer 2. A third investigator decided some conflicting points and made the final decision to choose the articles. The quality of the studies was based on the GRADE instrument and the risk of bias was analyzed according to the Cochrane instrument.

Results and Discussion

A total of 118 articles were found. Articles that presented low-quality scientific evidence according to GRADE, as well as articles that showed research biases, such as a low number of participants and dubious results were also excluded. A total of 67 articles were fully evaluated and 38 were included in this study (**Figure 1**).

Figure 1. Article selection (Systematic Review).



After analyzing the literary findings, it became clear that early detection and treatment of OC are important predictors to improve survival and reduce mortality [15]. The diagnostic process begins with the oral clinical examination, with visual inspection and digital palpation [16]. A thorough clinical inspection of the oral cavity can detect up to 99% of oral cancers [15-19].

In this sense, the development of hospital dentistry in America and Europe began much earlier, in the 19th century, with the efforts of researchers Simon Hullihen and James Garretson. Great efforts were made to obtain recognition. Later, it would have the support of the American Dental Association and the respect of the medical community [20,21]. Thus, dental practice in hospitals requires professional preparation in aspects related to the care of the oral cavity, as well as a better commitment to comprehensive and humanized care, based on actions aimed at providing biopsychosocial well-being to patients [20,22].

In this way, hospital dental activities are usually focused on the care of patients with severe systemic diseases, non-cooperative physical deficient, and neurologically compromised individuals. Dental actions can be performed safely and comfortably, to present less risk to patients, dentists, and health teams [21]. Requests for complementary exams allow for better diagnosis and follow-up, as well as planning with other professionals. These are advantages that dentists can have in the performance of their clinical activities in the hospital [23,24].

Besides, an intensive care unit (ICU) is a special department of a hospital or healthcare unit that provides intensive care. Intensive care units serve patients with serious and life-threatening illnesses and injuries who require constant care, monitoring, and support from specialized equipment and medications to ensure normal bodily functions. They are composed of highly trained doctors and nurses specialized in caring for critically ill patients [1,2].

In addition, ICUs are also distinguished from normal hospital wards by a higher staff-to-patient ratio and access to advanced medical resources and equipment that are not routinely available elsewhere. Common conditions that are treated within ICUs include acute respiratory distress syndrome (ARDS), trauma, multiple organ failure, and sepsis [25].

Also, dentists can act as health consultants and service providers in hospitals through the implementation of training, qualification, preventive guidelines, and assisted practice instructions, which must be followed by the qualitative evaluation of these behaviors to improve services and address needs. specific [24,26].

In this aspect, the assessment of the oral condition

and the need for dental treatment in hospitalized patients requires that the follow-up be carried out by a qualified dentist with hospital experience. Preventive clinical procedures, as well as procedures to assess oral health, oral lesions, and other oral alterations that may represent some risk or discomfort to patients, are part of the dentist's responsibility [24].

Added to this, the presence of bacterial plaque in the oral cavity can influence the planned medical interventions due to microorganisms found in the mouth. The virulence factors of these microorganisms contribute to the accumulation of bacteria associated with nosocomial pneumonia, ventilator-associated pneumonia, and bacterial endocarditis, which are the most common systemic and infectious diseases related to the hospital dental context [27,28].

Also, patients admitted to ICUs have poorer oral hygiene and have a higher prevalence of colonization of respiratory pathogens on their teeth and oral mucosa, as it favors the growth of a biofilm containing microorganisms capable of colonizing the lungs and upper airways, causing the which we call nosocomial or hospital pneumonia, being one of the main infections that affect these patients [28].

For Santos and Soares Jr. (2012) [29], the functions of the dental surgeon in the ICU are to restore and maintain oral health, prevent infections and oral injuries, perform emergency procedures in the face of trauma, avoid the aggravation of the systemic condition and the emergence of hospital infection and intervene with curative procedures promoting health and comfort to the patient. Thus, it is imperative to include the dental surgeon in the multidisciplinary team to reduce the worsening of the patient's health, the length of stay, and the cost of treatment.

Furthermore, the literature shows that the impairment of oral health by infections such as caries, gingivitis, and periodontal disease, can interfere with the systemic conditions of patients, contributing to the increase in the time and cost of hospital treatment, in addition to directly affecting the quality of care patients' lives. The presence of a dental surgeon in the ICU is essential, as many clinical situations require interdisciplinary planning for successful treatment [3].

In this context, in the initial period, the OC can be asymptomatic. It is necessary to identify persistent mouth sores and/or pain, localized changes in the appearance of the oral mucosa, localized changes in the consistency of the oral mucosa, persistent white or red spots or mixed white and red spots of the oral mucosa, raised spot or plaque on the oral mucosa, lump or persistent growth in the oral mucosa, area of bleeding located in the oral mucosa, as proposed by the World Health Organization and the National Institute of Dental and Craniofacial Research and the American Dental Association [18].

In this sense, cytological tests, biopsy [15,19], staining with toluidine blue, and detection techniques based on light and salivary biomarkers [30] stand out. Toluidine blue (TB) staining is a simple, inexpensive, and non-invasive technique to guide the diagnosis of malignant and pre-malignant lesions [31]. TB is a cationic metachromatic dye that chemically binds to the dysplastic epithelium (turning blue) [30]. In this sense, a 1% v/v aqueous solution is applied for 30 seconds to the area of the suspected lesion, after the application of 1% v/v acetic acid to remove the salivary and bacterial pellicle [30].

On the other hand, the autofluorescent image can provide additional information about the nature of the lesion [32], being an adjunct to the visual and tactile clinical examination [33]. Furthermore, human saliva presents organic and inorganic molecules, proteins, peptides, and electrolytes, representing more than 100 biomarkers [34-36], indicating pathological predictors, such as viruses, cytokines (IL-1b, IL-8, TNF-α), protein receptors (CD44) [36,37], and DNA and RNA markers [36-38].

Finally, the importance of self-examination is highlighted, which is an effective strategy in reducing the levels of mortality and morbidity caused by OC, making clear the importance of health education in improving people's living conditions [1]. Thus, in the hospital environment, the dentist can disseminate information, in addition to guiding, and encouraging self-examination so that it is diagnosed early, facilitating preventive work, thus giving the chance of cure [1,2].

Conclusion

Based on the objective of the present study and on the literary findings, it became evident that the elaboration of the work by dentists in hospitals can enable early and effective treatment of patients with oral cancer. It also made it possible to discuss dentistry in general, address dental care in the hospital environment, and highlight the difficulties faced in its insertion in hospitals. It is necessary to train and train the entire hospital team and the dental surgeon so that oral health is offered to patients, as well as to know the impact caused by oral problems on the systemic health of patients and implement specific protocols on the subject in all hospital aspects. The dentist must promote the general health of the hospitalized individual, based on interdisciplinary planning developed together with other health professionals, as well as assess the main needs of the patient and contribute to the quality of life of these individuals. According to the literature

consulted, it can be concluded how important the role of the dentist is as an integral part of the multi-professional team in the area of health in ICUs, as their presence could minimize such problems in hospitalized patients. Its insertion in hospitals would contribute to the maintenance of the patient's oral and general health, as well as the use of appropriate procedures during hospitalization.

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The authors declare no conflict of interest.

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References

1. Yurikusa T. [Medical-Dental Collaboration for Oral Supportive Care of Cancer Patients]. Gan To Kagaku Ryoho. 2021 Jun;48(6):763-767. Japanese. PMID: 34139720.
2. Rutkowska M, Hnitecka S, Nahajowski M, Dominiak M, Gerber H. Oral cancer: The first symptoms and reasons for delaying correct diagnosis and appropriate treatment. Adv Clin Exp Med. 2020 Jun;29(6):735-743. doi: 10.17219/acem/116753. PMID: 32598579.
3. Dholam KP, Sharma MR, Gurav SV, Singh GP, Prabhash K. Oral and dental health status in patients undergoing neoadjuvant chemotherapy for locally advanced head and neck cancer. Oral Surg Oral Med Oral Pathol Oral Radiol. 2021 Nov;132(5):539-548. doi: 10.1016/j.oooo.2021.07.018. Epub 2021 Jul 31. PMID: 34489214.
4. Aguiar ASW, Guimarães MV, Morais RMP, Saraiva JL. A Oral health care at the hospital level: report of experience teaching/service integration in dentistry. Rev Eletr de Extensão, 2010. v. 7, p. 100-110.
5. Tunes RS, Tunes U. Odontologia Hospitalar: status atual. Rev Bahiana Odont. 2018; v. 9, n. 1, p. 5-7.
6. Euzebio LF, Viana KA, Cortines AAO, Costa LR. Atuação do Residente Cirurgião-Dentista em Equipe Multiprofissional de Atenção Hospitalar à Saúde Materno-Infantil. Rev Odontol Bras Central. 2013; v. 21, n. 60, p. 16-20.
7. Warnakulasuriya S. Global epidemiology of oral and oropharyngeal cancer. Oral Oncol. 2009;45:309–316. doi: 10.1016/j.oraloncology.2008.06.002.
8. Dhanuthai K., Rojanawatsirivej S., Thosaporn W., Kintarak S., Subarnbhesaj A., Darling M., Kryshtalskyj E., Chiang C.-P., Shin H.-I., Choi S.-Y., et al. Oral cancer: A multicenter study. Med. Oral Patol. Oral Cir. Bucal. 2017;23:e23–e29. doi: 10.4317/medoral.21999.
9. Montero P.H., Patel S.G. Cancer of the Oral Cavity. Surg. Oncol. Clin. N. Am. 2015;24:491–508. doi: 10.1016/j.soc.2015.03.006.
10. Abati S, Bramati C, Bondi S, Lissoni A, Trimarchi M. Oral Cancer and Precancer: A Narrative Review on the Relevance of Early Diagnosis. Int J Environ Res Public Health. 2020 Dec 8;17(24):9160. doi: 10.3390/ijerph17249160. PMID: 33302498; PMCID: PMC7764090.
11. Romero-Reyes M, Salvemini D. Cancer and orofacial pain. Med Oral Patol Oral Cir Bucal. 2016 Nov 1;21(6):e665-e671.
12. Aregbesola B, Soyele O, Effiom O, Gbotolorun O, Taiwo O, Amole I. Odontogenic tumours in Nigeria: A multicentre study of 582 cases and review of the literature. Med Oral Patol Oral Cir Bucal. 2018 Nov 1;23(6):e761-e766. doi: 10.4317/medoral.22473.
13. Irie MS, Mendes EM, Borges JS, Osuna LG, Rabelo GD, Soares PB. Periodontal therapy for patients before and after radiotherapy: A review of the literature and topics of interest for clinicians. Med Oral Patol Oral Cir Bucal. 2018 Sep 1;23(5):e524-e530. doi: 10.4317/medoral.22474.
14. Miranda J, Monteiro L, Albuquerque R, Pacheco JJ, Khan Z, Lopez-Lopez J, Warnakulasuryia S. Coffee is protective against oral and pharyngeal cancer: A systematic review and meta-analysis.

Med Oral Patol Oral Cir Bucal. 2017 Sep 1;22(5):e554-e561. doi: 10.4317/medoral.21829.

15. Walsh T, Liu JL, Brocklehurst P, Glenny AM, Lingen M, Kerr AR, Ogden GR, Warnakulasuriya S, Scully C. Clinical assessment to screen for the detection of oral cavity cancer and potentially malignant disorders in apparently healthy adults. Cochrane Database Syst. Rev. 2013 doi: 10.1002/14651858.CD010173.pub2.
16. Ford P., Farah C. Early detection and diagnosis of oral cancer: Strategies for improvement. J. Cancer Policy. 2013;1:e2–e7. doi: 10.1016/j.jcpo.2013.04.002.
17. Practice C. Guideline for the early detection of oral cancer in British Columbia 2008. J. Can. Dent. Assoc. 2008;74:245.
18. Rethman M.P., Carpenter W., Cohen E.E., Epstein J., Evans C.A., Flaitz C.M., Graham F.J., Hujoel P.P., Kalmar J.R., Koch W.M., et al. Evidence-Based Clinical Recommendations Regarding Screening for Oral Squamous Cell Carcinomas. J. Am. Dent. Assoc. 2010;141:509–520. doi: 10.14219/jada.archive.2010.0223.
19. Pentenero M., Val M., Rosso S., Gandolfo S. Microbiopsy a first-level diagnostic test to rule out oral dysplasia or carcinoma in general dental practice. Oral Dis. 2018;24:109–111. doi: 10.1111/odi.12735.
20. Godoi APT, Francesco AR, Duarte A. et al. Hospital odontology in Brazil. A general vision. Rev Odontol UNESP. v. 38, p. 105-109., 2010.
21. Porto AN, Segundo AS, Borges AH, Semenoff TADV, MIRANDA F P. Hospital Dentistry: a proposal of new discipline. 2010. v. 9, p. 119-122.
22. Carcereri DL, Amante CJ, Reibnitz MT, et al. Training in dentistry and interdisciplinarity. Rev ABENO, 2011, v. 11, p. 62-70.
23. Gomes SF, Esteves MCL. Acting of the dental surgeon in the ICU: a new paradigm. Rev Bras Odontol, 2012, v. 69, p. 67-70.
24. Miranda AF. Oral health and care at intensive care units. J Nurs Care, 2016, v. 5, p.1-6.
25. The Intensive Care Society. What is Intensive Care? 2009. Disponível em: < https://web.archive.org/web/20091226214851/http://www.ics.ac.uk/patients___relatives/what_is_intensive_care_>. Accessed in: 07 March. 2022.
26. Mattevi GS, Figueiredo DR, Patrício ZM, Rath IBS. He participation of the dental surgeon in a multidisciplinary health team in the health care of the child in the hospital context. Cien Saude Colet, 2011, v. 16, p. 4229-4236.
27. Pobo A, Lisboa T, Rodriguez A. et al. A randomized trial of dental brushing for preventive ventilator-associated pneumonia. Chest, 2009, n.136, p. 433-439.
28. Ames NJ, Sulima P, Yates J M, et al. Effects of systematic oral care in critically ill patients: a multicenter study. Am J Crit Care, 2011, n. 20, p. e103-e114.
29. Santos PSS, Soares Junior LAV. Medicina Bucal - A Prática na Odontologia Hospitalar- Editora Santos; 2012, p.70-75.
30. Omar E. Current concepts and future of noninvasive procedures for diagnosing oral squamous cell carcinoma—A systematic review. Head Face Med. 2015;11:6. doi: 10.1186/s13005-015-0063-z.
31. Li Y.-N., Lu R., Zhang J., Zhou G. Inter-and intra-observer agreement on the judgment of toluidine blue staining for screening of oral potentially malignant disorders and oral cancer. Clin. Oral Investig. 2018;23:1709–1714. doi: 10.1007/s00784-018-2595-7.
32. De Veld D.C., Skurichina M., Witjes M.J., Duin R.P., Sterenborg H.J.C.M., Roodenburg J.L. Autofluorescence and diffuse reflectance spectroscopy for oral oncology. Lasers Surg. Med. 2005;36:356–364. doi: 10.1002/lsm.20122.
33. Tiwari L., Kujan O., Farah C.S. Optical fluorescence imaging in oral cancer and potentially malignant disorders: A systematic review. Oral Dis. 2019;26:491–510. doi: 10.1111/odi.13071.
34. Tecco S., Parisi M.R., Gastaldi G., Polizzi E., D'Amicantonio T., Zilocchi I., Gardini I., Gherlone E.F., Lazzarin A., Capparè P. Point-of-care testing for hepatitis C virus infection at an Italian dental clinic: Portrait of the pilot study population. New Microbiol. 2019;42:133–138. doi: 10.1111/cid.12370.
35. Crespi R., Capparè P., Romanos G.E., Mariani E., Benasciutti E., Gherlone E. Corticocancellous porcine bone in the healing of human extraction sockets: Combining histomorphometry with osteoblast gene expression profiles in vivo. Int. J. Oral Maxillofac. Implant. 2011;26:866–872.
36. Kaur J., Jacobs R., Huang Y., Salvo N., Politis C. Salivary biomarkers for oral cancer and pre-cancer screening: A review. Clin Oral Investig. 2018;22:633–640. doi: 10.1007/s00784-018-2337-x.
37. Moretti M., Lissoni A., Gastaldi G., Arrigoni G., Doglioni C., Abati S. Expression of hexokinase ii

in oral keratotic lesions with or without inflammation. Front. Physiol. 2019;10 doi: 10.3389/conf.fphys.2019.27.00057.

38. Franzmann E.J., Donovan M.J. Effective early detection of oral cancer using a simple and inexpensive point of care device in oral rinses. Expert Rev. Mol. Diagn. 2018;18:837–844. doi: 10.1080/14737159.2018.1523008.