



## Risks due to respiratory conditions

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### Abstract

Certain serious respiratory diseases could be negatively affected if the patient has periodontal disease and does not follow proper oral hygiene. Therefore, an exhaustive bibliographical review was carried out about the main risks and complications in respiratory conditions. There are also those who have been victims of the so-called septic thrombi, some pathogenic bacteria present in the oral cavity have taken center stage, as they can translocate due to proximity to the respiratory tract and reach the lungs.

**Keywords:** Respiratory Disease; Oral Health; Risk and Respiratory Complications in Dentistry

### Introduction

This chapter is of utmost importance since it must be internalized from two points of view, from the professional exposed to risk and from the patient. The stomatology professional is one of the workers most exposed to respiratory conditions because he practices his care in close relationship with the upper airways. Echo that keeps him in a constant occupational risk, on the other hand, is the exposure to certain materials that can be toxic to living beings. In the case of patients, these may have dissimilar risks for the respiratory tract, which may be affected by a surgical procedure, or the patient comes with altered respiratory physiology, as is the case of geriatric, smoking or allergic patients [1,2].

### Objective

Deepen and discuss the main risks of respiratory conditions in dental treatments.

### Analysis strategy

The search was based solely on respiratory conditions that affect dental treatment.

### Developing.

#### What are lung diseases?

Pneumopathies are diseases in which there is compromise of the lungs, which can occur due to the presence of microorganisms such as bacteria or parasites, or be a consequence of the inhalation of substances during professional activity, such as dust or asbestos, which leads to the manifestation of some symptoms such as cough, fever and shortness of breath.

One of the most common lung diseases that affects a large number of the population is pneumonia, which can be defined as an inflammatory lung lesion in response to the arrival of microorganisms in the distal airway and parenchyma [3,4].

### Clinical manifestations

The main clinical manifestations of pneumonia are cough, purulent or rusty expectoration, dyspnea, pleuritic pain and fever. Symptoms are nonspecific and poorly distinguish between pneumonia and other respiratory diseases. Pulmonary semiology, crackles and signs of consolidation, are also not very sensitive and not very specific for the diagnosis. According to other authors, the symptoms of lung disease can vary according to the cause, however, chest pain cannot be overlooked; dyspnea and tachycardia.

Clinical aspects in which the stomatology professional must be oriented when carrying out the physical examination and questioning of patients, and even more so if the procedure is under general anesthesia. Oral health and its relationship with lung diseases. Oral health offers clues about the state of general health, like other areas of the body, the oral cavity includes a high number of microorganisms, which while in balance are harmless, but this region is the gateway to the respiratory tract. digestive and upper respiratory [5].

This predisposes to exposure to different diseases. In this section, respiratory conditions are mentioned, dividing them into non-serious or serious ones, such as pneumonia, chronic obstructive pulmonary disease (COPD) and lung cancer. Patients with these nosological entities may experience complications in their clinical condition if they have poor hygiene and affected oral health. The

advances in recent years in medicine have made it possible to know that diseases of oral origin, such as periodontitis, share a close relationship between different systemic diseases, such as diabetes mellitus, cardiovascular diseases, digestive problems, diseases of the collagen, problems during pregnancy, and respiratory processes are not exempt from damage [6].

The oral cavity and respiratory infections Bronchial asthma is a chronic disease that causes the airways to become inflamed and narrowed. This causes difficulty breathing, showing wheezing, dyspnea, chest tightness, and cough. Several of the drugs prescribed to deal with this disease can cause negative effects in the oral cavity and pharynx. Strong anti-inflammatory medications (corticosteroids) can cause xerostomia or hyposalivation.

Leaving patients more prone to contracting oral infections of fungal etiology. The stomatologist must keep these aspects in mind since these drugs can influence the stages of healing and delay it. If the patient uses an inhaler that contains steroids, explain how to use it with a spacer. The spacer is a plastic tube that connects to the inhaler and maintains the proper dose while you inhale. Then the oral cavity should be rinsed with water without swallowing the liquid.

Doing this decreases your chances of getting a yeast infection in your mouth. Emphasis should be placed on the patient bringing their inhaler to all appointments. We must not forget to ask when the most recent crisis was, how often they have them, what triggers them, how serious they are and if they have been admitted to a hospital for this reason [6-8].

These patients do not always respond well to moments of stress, especially when they have been taking steroids for a long time. Normally, the adrenal glands produce hormones that help with the response to these stressful situations, but if you are taking these drugs, these glands do not function properly. Therefore, everything possible should be done to create a favorable environment for these individuals so that they feel more relaxed, avoiding any tense situation. When the homeostasis of the internal oral environment is damaged, certain species of microorganisms that may be present in very small quantities, find a way to develop and cause an increase in the aggressiveness of the dental plaque or biofilm that exists at the gum level. As a consequence, they cause an inflammatory reaction that is initially limited to the gingival tissue (gingivitis) and that when it progresses can compromise the support of the tooth and its long-term survival (periodontitis) [9-10].

It is important to note that there are three very serious respiratory pathologies that can be affected by this dangerous relationship between the presence of periodontal disease and the lungs: pneumonia, chronic obstructive respiratory disease and lung cancer.

Pneumonia is an infection of the lungs that can be caused by bacteria, mycoplasmas, viruses, fungi or parasites. Along with the flu, pneumonia is a major cause of death worldwide, especially among the elderly population. This disease also contributes to morbidity and a decrease in quality of life, as well as a very significant increase in hospital medical expenses.

Bacterial pneumonia is composed of several subtypes: community-acquired pneumonia, aspiration pneumonia, hospital-acquired (nosocomial) pneumonia, ventilator-associated pneumonia, and nursing home-associated pneumonia. In all cases, correlations have been made with the state of oral health. Among nosocomial pneumonias, those associated with aspiration in patients in intensive care units (ICU) and with mechanical ventilation are especially serious. The main cause would be aspiration of oropharyngeal secretions into the lower respiratory tract [11,12].

This is because, through intubation, the natural barrier between the oropharynx and the trachea is lost. In addition, there may be greater bacterial colonization in the mouth due to the lack of correct oral hygiene and lower salivary secretion, which increases the passage of potentially pathogenic oral bacteria along the tube. Strategies to reduce the likelihood of pneumonia occurring in this type of patient will be aimed at reducing oral microorganisms through the mechanical removal of dental plaque and the chemical control of the most pathogenic microorganisms.

Aspiration pneumonia associated with periodontal disease is based on culture studies carried out on transtracheal aspirations taken directly from lung areas infected with anaerobiosis techniques. Many of these microorganisms were identified as present in periodontal pockets and other infections of dental origin. Studies have shown that aspiration pneumonia occurred more frequently in dentate individuals who had inadequate oral hygiene than in edentulous individuals.

The combination of risk factors with periodontal disease, as well as the decrease in salivary flow, secondary to the use of certain medications, promotes a higher concentration of anaerobic bacteria in saliva. Weakened, bedridden individuals with difficulty swallowing and high concentrations of microorganisms in saliva are predisposing factors for aspiration pneumonia [12-14].

Chronic obstructive pulmonary disease (COPD) consists of chronic airflow obstruction due to narrowing of the airways along with excess mucus production resulting from chronic bronchitis and/or emphysema. Microorganisms in the oral cavity are linked to infections of the endocardium, meninges, mediastinum, vertebrae, as well as the hepatobiliary system. Aspiration of oropharyngeal (including periodontal) pathogens is the dominant cause of pneumonia; it can be stated that there is an important relationship between periodontal disorders and chronic obstructive pulmonary disease.

The way you sit in the dental chair can affect the breathing of these patients. Therefore, the patient must be accommodated so that he can feel comfortable in the dental chair. If you need oxygen during a consultation, the professional should have a dose to provide it to you if necessary. If you use oxygen at home, you should take your portable oxygen tank to the dental office making sure it is full. And during the interrogation, the drugs he consumes are confirmed, just as in asthmatic patients.

Chronic bronchitis is defined as the result of irritation of the bronchial airways and secretion of mucus sufficient to cause cough with expectoration for at least three months a year and for two consecutive years. Emphysema consists of the permanent enlargement of the air spaces distal to the terminal bronchioles along with the destruction of the alveolar septa. As in cases of pneumonia, bacteria present in the mouth of patients with periodontal disease can pass to the lungs and cause infection. Furthermore, both periodontal disease and COPD share risk factors and indicators such as tobacco, age, obesity, socioeconomic status, and living conditions [13-15].

In recent years, many observational studies have been carried out on lung cancer, in which associations have been found between periodontal disease and different types of cancer. The biological mechanism would respond to factors such as the previous existence of diseases related to the affected organ or tissue, the passage of pathogenic bacteria to the affected tissues and, above all, an increase in systemic inflammation. Care in patients at risk of respiratory disease If the patient who comes for consultation suffers from a respiratory condition, the professional during admission must make an updated list of all the medications that the affected person consumes.

Where it includes prescribed medications and others such as antacids. You should also include vitamins or other nutritional supplements. This will allow the specialist to have control over what his patient consumes and to have an idea of the possible risks to which the patient is exposed due to the consumption of drugs. Hospitalized patients at risk of respiratory disease should be treated, to the extent possible, by stomatologists to control periodontal disease, to minimize bacterial contamination of oral tissues. In stomatological consultations, scaling and root planing of the affected teeth can be carried out, along with the adjuvant use of mouthwashes with 0.12% chlorhexidine. In addition, it is very important to implement effective oral hygiene measures that reduce the risk of pathogenic bacteria entering the respiratory tract [16,17].

In patients admitted to an intensive care unit (ICU), oral hygiene is the responsibility of hospital staff or caregivers. For mechanical oral hygiene, the teeth, gums and tongue can be cleaned using gauze soaked in 0.12% chlorhexidine. The oral cavity can also be

washed exhaustively through all anatomical regions by irrigating, with the help of a syringe, with chlorhexidine and subsequently aspirating. Carrying out these measures positively influences the patient's evolution, anticipating different risks and complications that can be added to the current condition presented by the affected individual. It is recommended that intensive care units have a dental care program that includes the attention of a professional in this branch from time to time.

The new pneumonia caused by SARS-COV-2 Last December 2019 in China, an outbreak of pneumonia caused by a new viral strain of coronavirus or SARS-CoV-2, never before seen in humans, aroused attention in the world. Likewise, on January 30, a public health emergency of international concern was declared by the WHO, marking the beginning of a highly pathogenic pandemic called "coronavirus disease 2019 (COVID-19)" that is transmitted from person to person. through respiratory secretions.

Its mechanism of action begins as SARS-CoV-2 enters the cell using the angiotensin-converting enzyme 2 (ACE2) as a receptor, which is found in high proportions in the kidney, lungs and heart and In turn, it has a relevant role in the conversion of angiotensin I to angiotensin 1-9, and of angiotensin II to angiotensin [18-19].

It has been reported that critical cases of COVID-19 show elevated levels of angiotensin II, and that these are related to viral load and lung damage. The viral load reaches its highest point in the first seven days of the onset of the disease, and then begins to reduce significantly around day 10; and finally descend to unidentifiable levels around day 21.

The incubation time of the virus is five days, reporting variations that range between two and fourteen days; However, some reports indicate a time of 24 days, being most contagious during the first three days after the appearance of symptoms. The disease normally presents with fever, cough and difficulty breathing, with headache and digestive manifestations being less common.

Sars-cov-2 and oral tissues Signs and symptoms associated with oral disorders in patients with COVID-19 include alterations in the central nervous system such as dysgeusia and anosmia, non-specific oral ulcerations, desquamative gingivitis, petechiae, salivary gland infections such as parotitis; alterations in the oral mucosa, presentation of erythematous lesions and blisters [19,20,21].

Also, possible reactions in the oral cavity due to the effects of the medicines used during the treatment of these patients, such as pearly white vesicular exanthem on the upper palate, oropharynx and oral cavity, which appears in the first 3 days. of the infection with few lesions, progresses and disappears when the viremia is treated.

Rashes, ulceronecrotizing gingivitis, dry mouth, prominent lingual papillae, cracked lips, and facial pressure ulcers have been detected. Among the main locations, the masticatory mucosa stands out: palate and gingival mucosa, lining mucosa: labial and cheeks, and specialized mucosa: tongue. Intraoral manifestations in patients with COVID-19 often occur prior to respiratory symptoms, although the exanthematous lesions observed in patients with this disease can be observed in other viral processes [22-24].

Likewise, the presence of pain and the duration of its evolution may be factors to consider. Studies carried out in Mexico, Spain and France suggest a link between the disease and the generation of vesiculobulbous, ulcerating and/or ampullary lesions; this relationship is not yet proven and the lesions may appear secondary to the infection. Some patients reported pain in the palate, in addition to having the possibility of opportunistic infections from immunosuppression.

Lacerations compatible with herpes simplex lesions were found, while others reported pain in the tongue and presented lesions related to erythema multiforme. The oral epithelium expresses the ACE2 receptor; particularly in the mucosa, tongue, and salivary glands, so the oral cavity appears to be a direct entry route for SARS-CoV-2. Oral clinical signs in patients with COVID-19 provide a significant overview of the consequence or impact that SARS-CoV-2 may have on the oral and systemic health of patients suffering from this disorder.

Thus, among the relevant oral symptoms related to COVID-19, ageusia seems to be an unequivocal symptom resulting from said pathology; however, the evidence discussed suggests that other oral clinical symptoms could be directly or indirectly related to the disease [25-27].

Care and protection of stomatologists, oral and maxillofacial surgeons Stomatologists, oral and maxillofacial surgeons are especially vulnerable to suffering from respiratory conditions, due to extensive and close exposure to the oral, salivary and nasal cavities and secretions of patients and their body fluids. Additionally, they are sensitive to aerosol exposure in procedures such as performing a tracheostomy, tracheostomy dressings, airway aspiration, drainage of abscesses, irrigation of wounds, use of ultrasonic/piezoelectric devices or high-speed handpieces. Therefore, it is recommended and established that the professional use protection with surgical masks during all care procedures, that they change them at least every four hours (or before), that their body temperature be checked twice a day, and that they be monitored for the possible appearance of any symptoms. If symptoms compatible with COVID 19 are identified, they should cease their healthcare activity and undergo a diagnostic test with high priority [28-30].

Currently, specific guidelines and recommendations for the protection of health professionals involved in diagnostic and therapeutic procedures in anatomical areas of high risk of contagion such as the oral cavity and the head and neck area are scarce and limited and are in process. of change and evolution. As a general rule, a SARS-CoV-2 detection test should be performed before carrying out a surgical procedure or admitting a patient. The patient with an urgent/emergent condition that does not allow sufficient time to perform this test should be treated as potentially infectious. Because there are a large number of asymptomatic SARS-CoV-2 positive patients, it should be assumed that, from the outset, all patients are potentially infectious [31-34].

## Conclusion

One of the main risks of respiratory diseases in dental practice is infection.

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