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Inflammatory Processes, Viral Infections and Dental Practice during Covid-19

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ABSTRACT

The mouth is a natural reservoir of several microorganisms resulting from various ecological determinants, being conducive to contagion, as it is an open system for contamination, to which the oral health team is exposed. This microbiota, in general, is in harmony with the host and is quite relevant, as it contributes to the development of the mucous immune system. However, local and/or systemic changes can result in imbalance and clinical manifestation of diseases in the mouth, as reported in this chapter, about coronavirus, hepatitis, herpes, varicella-zoster, infectious mononucleosis, cytomegalovirus, ebola, and human immunodeficiency virus (HIV). Oral hygiene is essential to maintain harmony between normal oral microbiota and external contamination, and, as is known, the mouth is part of the digestive and respiratory system and, in this moment of the lethal and quite contagious SARS-VOC 2 pandemic, the dental practice needs to reinforce biosafety care and reduce the vulnerability of staff and patients, in order to favor the good practices of home dental care, outpatient and/or hospital assistance.

Keywords: Inflammatory Processes; Viral Infections; Dental Practice; Covid-19

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INTRODUCTION

Viral infections are quite common and account for thousands of deaths worldwide, every year (DIAS, 2017) [11]. Viruses are organisms that are characterized by the need to parasitize a cell to carry out its reproduction cycle. In the host cell, they release DNA or RNA molecules, which contain their information, to be transformed into viral proteins that influence the mechanism of these cells, enabling viral replication within them (COELHO-CASTELO et al., 2009) [9].

Upon entering the body, the first defense against the virus is the innate immune response, where the cells infected by the virus form the Type I Interferons and, when interacting with an uninfected cell, defend it from infection and contribute to the adaptive immune response. Another way for Interferon-gamma (IFN-γ) to act against viral infections is by activating macrophages and Natural Killer (NK) cells, which release cytokines, such as granzyme and perforin, and eliminate infected cells. Still at this stage, macrophages and other antigen-presenting cells produce IL-12, which motivates NK cells to perform cytotoxicity and generate more IFN-γ, intensifying the microbicidal potential of macrophages (MACHADO et al., 2004) [19]

However, many viruses are able to overcome the innate immune response due to their high rate of replication and/or mutation (COELHO-CASTELO et al., 2009) [9]. But, in parallel to this response, there is an adaptive immune response against these viral cells, where TCD8 + cells are activated, which identify an infected cell and destroy it by inducing apoptosis, or by releasing cytolytic proteins such as perforin and granzyme. Also, there is the activation of TCD4 + cells, which together with B cells form antibodies, acting especially as neutralizing molecules, preventing the virus's relationship with the host cell (MACHADO et al., 2004) [19].

In diseases such as Hepatitis B, the antibody is of fundamental importance, as it protects against viral infection when it comes to a host previously sensitized by a previous infection or by immunization (MACHADO et al., 2004) [19]. Another viral infection is hepatitis C, caused by the hepatitis C virus (HCV) and which can manifest itself in an acute or chronic form, the latter being the most common form. (BRASÍLIA / DF, 2020) [5]. The main forms of transmission of the Hepatitis B virus (HBV) and Hepatitis C (HCV), are through body fluids such as blood and saliva. (MARTINS et al., 2015, MOODLEY; NAIDOO; WYK, 2018) [9,20].

In addition, there are some viruses that contaminate and destroy cells of the immune system, such as the HIV virus (Human Immunodeficiency Virus) that causes AIDS. These have a large reduction in CD4 lymphocytes and depletion of the infected organism's immune system, resulting in the appearance of a series of diseases such as malignant neoplasms and opportunistic infections (MOTTA et al., 2014) [21].

In January 2020, a new type of coronavirus was announced, SARS-CoV-2. The same is a pleomorphic RNA virus, highly infectious, and has a fast rate of recombination of genes due to constant errors in the RNA polymerase-dependent replication process. It is also capable of causing serious respiratory diseases (PEREIRA et al., 2020) [30].

It is increasingly evident that there is a wide variety of viral agents, many unidentified, that can be new or newly recognized, or old reemerging. The last few decades have seen the global emergence of new viral infections, such as Ebola virus disease (EVD) (SCULLY; SAMARANAYAKE, 2016) [35].

When a virus attacks a cell, what determines if the cell will be or not targeted for infection, is the presence or absence of receptors recognized by the viral adsorption protein. In the case of the Ebola virus, it is able to recognize and bind to different types of receptors present on the cell surface, such as: the folic acid receptor, integrins, lectin type C, Tim-I, and TAM (SOUZA, 2015) [36].

Infections such as those caused by the herpes virus are capable of infecting different types of hosts and have the characteristic of constituting latency, preserving themselves in the host's cells throughout their life, and can reactivate in immunosuppressed patients (RODRIGUES et al., 2002) [32]. There are 8 types of herpesvirus in the family Herpetoviridae. They are transmitted through body fluids, each one with its specific form of transmission, diagnoses, and treatments, which will be described later. (CLARKSON; MASHKOOR; ABDULATEEF, 2017) [8]

The oral cavity is considered a favorable place for virus transmission, is one of the most important focus of viral and bacterial infection (DIAS, 2017) [11]. Because of these characteristics, oral health professionals are among the categories of greatest risk for transmission and contraction of viral infections, as they are exposed to close contact with patients, saliva, aerosol, blood, and the handling of sharp contaminated instruments (PENG et al., 2020) [29].

In view of this, some viruses are of importance in dental practice due to their form of transmission, as they present oral manifestations, a form of diagnosis and treatment pertinent to the exercise of the dental surgeon, such as: coronavirus, hepatitis B and C, human and herpesvirus its 8 subtypes, Ebola and HIV.

CORONAVIRUS

The new coronavirus (SARS-CoV-2) appeared in Wuhan, China, in late 2019, having a probable association with a seafood market, and culminated in a global health phenomenon due to its high virulence and great power of dissemination. Genetic and epidemiological research indicates that the outbreak probably started with the animal-to-human transmission, followed by the human-to-human spread. (CHEN; LIU; GUO, 2020) [7]

Although information about the virus has come worldwide recently, the first viruses in the coronavirus family have been discovered since 1937. There are currently 6 types of human coronavirus, HCoV-OC43, -229E, HCoV-NL63, HKU1, MERS-CoV, and recently, on January 7, 2020, the Chinese announced SARS-CoV-2. SARS-CoV-2 is the etiologic agent of COVID-19 disease. This is a single-stranded RNA virus from 60 to 140 nm, classified with the genus β-Coronavirus, and has a crown appearance (LO GIUDICE, 2020; PENG et al., 2020) [7,19].

Studies show that SARS-CoV-2 uses the angiotensin-converting enzyme 2 (ACE2) as a receptor, which is present on the surface of cells of the oral mucosa, pneumocytes, and enterocytes. After coupling the virus to the host cell, the RNA of the viral genome is released in the cytoplasm, initiating its replication cycle (CHEN; LIU; GUO, 2020) [7].

Contagion occurs through biological fluids, such as: blood, saliva, nasal discharge, directly through infected individuals or indirectly, through infected surfaces, where it can remain for up to 72 hours (PENG et al., 2020) [29].

The clinical signs and symptoms related to Covid-19 are nonspecific. Therefore, any of these symptoms can be observed: body temperature> 37.4 ° C, dry cough, dyspnea, asthenia, muscle pain, headache, sore throat, diarrhea, hyposmia, hypogeusia and vomiting. The cases of the cases show only respiratory symptoms, however, SARS-CoV-2 and MERS-CoV can lead to serious respiratory diseases. Usually, the disease follows this course mainly in risk groups, especially the elderly and those with chronic diseases (CHEN; LIU; GUO, 2020) [7].

The disease is classified as mild (mild symptoms), moderate (body temperature> 37.4 ° C, respiratory symptoms, signs of pneumonia are seen with radiology), and severe (dyspnea and/or hypoxemia, with rapid progression to Discomfort Syndrome Respiratory System (ARDS), septic shock and acidosis). In very severe patients, severe metabolic changes, coagulation deficiency, and multiple organ failure can occur (LO GIUDICE, 2020) [17].

Other signs and symptoms associated with COVID-19 are also being reported. Some authors have identified dermatological implications in affected patients, including lesions on the hands and feet, vasculitis, skin rash, urticaria, and varicella-type lesions (CARRERAS-PRESAS et al., 2020) [6].

Carreras-Presas et al. (2020) [6], in turn, reported oral manifestations that presented pain, scaly gingivitis, ulcers, and blisters. As described by Scully and Samaranayake (2016) [35], common patients seen in other viral processes, such as foot-and-mouth disease and herpetic gingivostomatitis. And the conclusion of the research was that there is a need for further studies to be carried out to determine whether these manifestations or occurrences occur due to SARS-CoV-2 infection or whether the emotional distress of the situation itself triggers the injuries.

Carreras-Presas et al. (2020) **[6]** further suspect that intraoral measures are not frequently diagnosed due to the recurrent neglect in performing intraoral examinations, and recommends that these examinations be performed on affected patients, whenever recommended protective measures are available.

Epidemiological studies have shown that the incubation period varies from 1 to 14 days, mainly between the 3rd and 7th days, being contagious in its latency period, that is, in asymptomatic infected individuals. This fact demonstrates the importance of early laboratory diagnosis as an RT-PCR, used to detect viruses through respiratory secretions. The importance of performing laboratory tests is also due to the fact that COVID-19 does not present pathognomonic symptoms.

On March 11, 2020, after the World Health Organization (WHO) raised the level of contamination to the pandemic, several recommendations, notifications and technical notes were published by the General Coordination of Oral Health of the Ministry of Health in Brazil, Control Centers, and Disease Prevention (CDC) and the American Dental Association (ADA), which, in general, recommend only maintaining dental procedures on an urgent or emergency basis, although reducing the spread of the virus in a high-risk environment, such as dental offices.

Among health professionals who are at high risk of occupational contamination, we call attention to dentists, who are among the professionals with the biggest exposure to COVID-19, due to the performance of intraoral procedures, having very close contact with the patient and their fluids, in addition to the production of aerosols for some procedures (PENG et al., 2020) [29].

Given the current scenario in which health professionals are chosen, biosafety measures are essential and include temperature monitoring, testing for viruses, use of an N95 or PFF2 mask, social distance, providing virtual assistance when possible, avoiding crowds.

For Dental Surgeons, the use of ultrasound, the high and low rotation pen and triple syringe should be avoided, elective procedures should be postponed and in cases of emergency or urgency involving patients who present signs and symptoms of respiratory infection, the same should be attended to in care units that have an air infection isolation room. (ADA, 2020) [2].

In addition, dental appointments should be made on scheduled time, avoiding a large number of people in the waiting room. It is also recommended that oral health professionals use telecommunication, before dental treatment, for screening symptomatic patients and provide guidance on oral health by the dentist (ADA, 2020) [2].

In the necessary assistance, before the intraoral examination of the patient, mouthwash should be performed with 1% or 1.5% hydrogen peroxide or 0.2% povidone and intraoral radiographs should be avoided, as they can trigger a reflex cough. (ADA, 2020; PENG et al., 2020) [2,29]. Studies show that the SARS-CoV-2 virus is sensitive to ultraviolet rays, heat (inactivated at 56 ° C for 30 min), lipid solvents

such as ether, 75% ethanol, and disinfectants containing chlorine, peracetic acid, and chloroform. It is not sensitive to chlorhexidine (LO GIUDICE, 2020) [17].

All of these measures combined, work to control the pandemic by COVID-19 and protect oral health professionals. So far there is no specific treatment for the disease, only symptomatic control, making prevention the most effective method to fight the disease. The SARS-CoV-2 pandemic can have a profound impact on dentistry, due to the virus being transmitted mainly by droplets, sneezes, and aerosols, representing a high risk of transmission in almost all dental procedures.

In COVID-19 times, it is worth remembering that cancer patients, in addition to being a risk group for infection with the new coronavirus, are more susceptible to the development of oral complications resulting from cancer itself when located in the head and neck region and/or the antineoplastic treatments instituted, being more frequently used of radiotherapy, chemotherapy, and surgery. Each therapy acts in a different way, however, within their specificities, all have some potential to cause internal side effects. Thus, dental care in oncology is essential, as it can minimize or even avoid most complications through an individualized approach protocol for each patient, reducing morbidity and mortality related to cancer treatment (VIDAL, 2015; MACÊDO, MELO, VIDAL, 2019) [18,37]

It is still exemplified in the oncology dental hospital care performed in the days of COVID 19, as cancer does not wait and, consequently, antineoplastic treatment cannot be interrupted. AFTS and the responsible person consented to the documents and the disclosure of their case for academic purposes, signing the Informed Consent Form. Study approved by the Research Ethics Committee of the University of Pernambuco under opinion no. 3,184,856.

With increased biosafety care, dental care was provided to AFTS, whose immunohistochemistry (CB47690 / 19) revealed primary CD20 positive mediastinum B major lymphoma, stage III. AFTS had the LNH 2016 protocol as an antineoplastic medical therapy that included the medication Rituximab (735mg), Methotrexate (MTX), and Arac. On 02/05/2020 AFTS was hospitalized for the start of chemotherapy cycles already under the supervision of the hospital dentistry team with a focus on oncology, and the Standard Oral Care Operational Protocol associated with the use of the Low Power Laser (LBP) was instituted) for prevention and control of oral mucositis (Photo 1). AFTS was hospitalized for better oncological follow-up, there were no reports of respiratory symptoms, nor other systemic complications. The Covid-19 diagnostic test was requested, the method used for real-time RT-PCR. The material was collected with the BIOMOL OneStep / COVID - 19 kit and the result was negative for Covid-19. In fact, the dental team also carried out the Covid-19 investigation exam, which was negative, and each month of exams are repeated to monitor and control both the patient's health and the care team. AFTS is still undergoing chemotherapy and maintained as oral functions and comfort with hospital dental care in oncology being performed satisfactorily.

HEPATITIS

Of viral hepatitis, type B and C are at higher risk of contamination for Dental Surgeons, as well as the Oral Health Technician (TSB) and Oral Health Assistant (ASB). Becouse of the forms of contagion occur through body secretions to which professionals are exposed during dental clinical practices, as examples: the risk of accident with sharps at the time of incision with a scalpel blade to perform a biopsy, in handling the needle for anesthesia or during suturing, after extraction.

Practices like these make dental professionals very susceptible to the disease. Still, as type B and C hepatitis when added together, it corresponds to 96% of the mortality and morbidity rates due to cirrhosis and liver cancer in the world, due in general, as chronic viral hepatitis evolve asymptomatically, making the diagnosis late, in advanced stages of the disease (WHO, 2017) [27].

HEPATITIS B

The hepatitis B virus (HBV) is a double-stranded DNA virus partially belonging to the family, hepadnaviridae. It has four serotypes, and, at the level of the surface antigen (HbsAg), nine smaller subtypes (GUNARDI et al, 2017) [15]. Eight genotypes and several subgenotypes with distinct geographic distribution were also identified.

Photo 1 - Shows application of Low Power Laser (LBP) to control oral mucositis in a patient undergoing antineoplastic chemotherapy and under hospital dental care in oncology in times of Pandemic by SARS-CoV-2. (Photo - Collection of the Dentistry Service of the Oncology Center of the Oswaldo Cruz University Hospital of the University of Pernambuco - CEON-ODONTO/HUOC/UPE).

An infection with the hepatitis B virus (HBV) is one of the main health problems in the world, with an incidence of approximately 4.5 million cases per year and approximately 620,000 deaths per year, being a highly lethal disease and a major cause of death in the world (ADENLEWO; ADEOSUN; FATUS, 2017) [1].

HBV has a high degree of pathogenicity and infectivity and can remain active for at least one week in dry blood and at room temperature. Its antiviral resistance is up to 100 times greater than that of the Human Immunodeficiency Virus (HIV) and 10 times greater than the virus that causes hepatitis C (HCV) (GARBIN et al., 2020) [13].

Acute HBV infection resolves spontaneously or progresses to chronic infection, which goes through 3 phases: one tolerant to the immune system, one immune active, and one inactive. There may also be the fourth phase, called the reactivation phase (WHO, 2016) [27]. Patients can progress from one phase to the next or go back and some spontaneous resolution after the third or fourth phase (ADENLEWO; ADEOSUN; FATUS, 2017) [1].

Some factors determine the progress of patients in these phases, such as the level of HBV endemicity in the community, age at the time of infection, mode of transmission, and HBV genotypes and subgenotypes. Hepatocellular carcinoma and liver cirrhosis are the main fatal conditions caused by the chronic (ADENLEWO; ADEOSUN; FATUS, 2017) [1].

HBV is transmitted through contact with infected blood or body fluids (semen, urine, and saliva) (WHO, 2016) [18]. Health professionals are at a greater risk of contracting the virus, and therefore, HBV infection is considered an occupational risk. Medical and dental students are a high-risk group for infection and their exposure rate is comparable to the hospital staff (ADENLEWO; ADEOSUN; FATUS, 2017) [1].

The prevention of HBV transmission must be done with precautionary standards (hand hygiene, proper disposal of sharp objects, and use of personal protective equipment) and vaccination (ADENLEWO; ADEOSUN; FATUS, 2017) [1].

There is great concern on the part of world health centers, making it necessary to publish biosafety protocols and public policies aimed at preventing and consequently reducing the incidence of the disease. In this perspective, the World Health Organization (WHO), in 2015 launched as guidelines for prevention, care, and treatment of people with hepatitis B infection, with the objective of guiding health professionals on the risks of contagion and its prevention.

Immunization through the vaccine is essential for the prevention of the disease, being this the main preventive method against HBV. Vaccination is used during the 1980s, although it was formulated in the 1970s, proving to be a very effective and safe preventive method, as it is highly effective in producing the antigen present in HBV (anti-HBs) (NELSON; EASTERBROOK; MCMAHON, 2016) [23].

However, although the vaccine has a high immunogenic potential, about 10% of the requirements that complete their immunization schedule with the three recommended doses, do not develop protective immunity, that is, have titers of less than 10mUI / ml. That is why it is important to carry out seroconversion tests, as not all professionals who bring hepatitis B virus vaccines, in fact, have immunological protection, thus, necessary doses of reinforcement to stimulate adequate levels of to. It is recommended to perform quantitative anti-HBs tests one to two months after the last dose of the vaccination schedule (GARBIN et al., 2020) [13].

HEPATITIS C

Infection with the hepatitis C virus (HCV) affects more than 130 million people worldwide and accounts for the majority of parenteral “non-A non-B” (NANB) hepatitis. In Brazil, in 2014, the prevalence of anti-HCV was 1.38%, with dentists in the country having a prevalence of 0.4% to 0.9% (GARBIN et al, 2014) [12].

HCV has a single-strand positive genome, belongs to the family Flaviviridae, genus Hepacivirus and classified into six genotypes (GARBIN et al, 2014) [12].

The incubation period is 1 to 3 weeks. Symptoms may begin within 4 to 12 weeks, however, most of those infected (60% to 70%) are asymptomatic. For this reason, most patients only recognize that they are infected when there is a chronicity symptom, increasing the risk for cirrhosis, hepatocellular carcinoma, and death (GARBIN et al, 2014) [12].

When infected people show symptoms, are found: abdominal, muscle or joint pain, fatigue, anorexia, fever, nausea, jaundice, dark urine, pale stools, and an increase in the size and/or change in the consistency of the liver. As the condition progresses, liver failure and portal hypertension may occur, including ascites, bleeding from the gastric and esophageal veins, and hepatic encephalopathy (NAYAK et al, 2012) [22].

The main form of HCV transmission is the parental route, through large or repeated exposure to contaminated blood or blood products. Other less frequent and effective modes include percutaneous exposure in small doses with contaminated blood (accidents with needles or sharp objects) or exposure of the mucosa to blood or blood products (childbirth or unprotected sex) (GARBIN et al, 2014) [12].

The diagnosis of HCV is made with the detection of anti-HCV by third-generation ELISA assays and should be performed from 2 to 8 weeks after the acute phase of the infection. However, unlike HBV, there is no vaccine for HCV and in cases of accidental exposure, there is no specific effective method for reducing the risks of transmission of the hepatitis C virus, and the use of immunoglobulins is not recommended, as it did not show prophylactic efficacy (GARBIN et al, 2014).

Treatment is done with a combination of IFN-a2a or IFN-a2b pegylated and ribavirin. The goals of treatment are to relieve liver fibrosis, reduce transaminase levels, prevent hepatocellular carcinoma, improve quality of life and decrease HCV viral load, preventing the spread of the disease (PEARLMAN; TRAUB, 2011) [28].

Before HCV treatment, it is recommended to assess patients' oral health. If oral diseases such as periodontitis and pulpitis are observed, treatment may be postponed, as during therapy there is reduced resistance to infection. Therefore, attention to the oral health needs to be reinforced (GARBIN et al, 2014) [12].

Up to 74% of infected patients may develop some extrahepatic manifestation. Among the extrahepatic manifestations involving the oral region, lichen planus and Sjögren's syndrome (SS) are known. These requirements also present a high risk for caries and periodontal disease due to hyposalivation, and poor oral hygiene, insulin resistance, or prolonged bleeding (GARBIN et al, 2014) [12].

Infection by the hepatitis C virus for dental professionals is comparable to that of the general population, this is due to the fact that the virus has low transmission effectiveness in sharps accidents, when compared to the hepatitis B virus, for example. However, the high frequency that the Dental Surgeon remains exposed to occupational accidents with contaminated instruments, leads to a potential risk of contamination. Therefore, all care with biosafety must be present throughout the entire clinical care, treating all patients as a potential source of transmission of several viruses.

HERPES

The herpes virus (HHV) has 8 types. They are: herpes simplex (HSV) type 1 (HSV-1) or human herpesvirus type 1 (HHV-1) and the herpes simplex virus type 2 (HSV-2, HHV-2), the varicella-zoster virus (VZV, HHV-3), Epstein-Barr virus (EBV, HHV-4), cytomegalovirus (CMV, HHV-5), HHV-6, HHV-7 and HHV-8 (SCULLY, 2013) [34].

HHVs are linear, envelope and double-stranded DNA viruses. Responsible for a variety of orofacial diseases, they are highly infectious, transmitted by saliva, genital secretions, urine, tears, respiratory secretions, or direct contact with oral mucus skin lesions (SCULLY, 2013) [34].

HUMAN HERPES TYPE 1 AND 2

The World Health Organization (WHO) estimated in 2012 that 67% of people under 50 are infected with HSV-1 and approximately 11% of people aged 15 to 49 are infected with HSV-2 (CLARKSON; MASHKOOR; ABDULATEEF, 2017) [8].

Clinically, it can be seen in its primary form, which usually occurs in childhood and is usually asymptomatic; or secondary, which occurs due to reactivation of the infection. After the primary infection, the virus migrates to the sensory or autonomic ganglia (trigeminal), where it remains inactive until reactivation (secondary or recurrent form). The reactivation can occur due to febrile illnesses, sunburn, minor trauma, emotional stress, hormonal changes in menstruation and incubation varies from several days to 2 weeks (NEVILLE et al, 2016) [18]. In immunocompromised obligation, human herpesvirus infections are more extensive and severe (CLARKSON; MASHKOOR; ABDULATEEF, 2017) [8].

HSV-2 is structured similarly to HSV-1 but has a predilection for the genital mucosa. Transmission usually occurs on oral to genital contact. The effect of increasing the practice of orogenital sex was an increase in the frequency of oral and oropharyngeal infection caused by HSV-2 and anogenital infection caused by HSV-1. Still, being caused by HSV-1 or HSV-2, the lesions are the same (CLARKSON; MASHKOOR; ABDULATEEF, 2017) [8].

HSV-2 becomes latent in the autonomic ganglia (lumbosacral region) and can also cause eye damage in newborns, in which transmission occurs during delivery due to ruptured membranes and/or direct contact with vaginal

secretions of infected mother (NEVILLE et al, 2016) [24].

The primary herpetic gingivostomatitis is an acute onset of the primary form of HSV-1. Normal occurs between 6 months and 5 years, usually presents symptoms of fever, chills and cervical lymphadenopathy, lesions of the intraoral mucosa (size 2 to 3 mm), and skin lesions, which regress between 7 to 10 days (CLARKSON; MASHKOOR; ABDULATEEF, 2017) **[8]**.

Herpes labialis is a secondary or recurrent manifestation that occurs in the perioral or oral region, on the hard palate and gingival tissues. In general, it produces burning and itchy root before the appearance of vesicles, it can be common, painful, and persistent. Recurrent cold sores appear to occur more frequently in women after adolescence with white, non-dry skin (BALLYRAM et al, 2016) **[3]**.

Most primary HSV-1 diseases are subclinical and are only recognized when there is a recurrent herpetic infection, with no history of previous primary herpetic gingivostomatitis. Herpetic Whitlow occurs when the virulent orofacial lesions come into direct contact with the fingers and take about 4 to 6 weeks to resolve (BALLYRAM et al, 2016) **[3]**.

The diagnosis is made based on clinical presentation and virus cultures or immunological assays using monoclonal or DNA hybridization in situ. The ideal treatment is at the onset of symptoms. Acyclovir and its analogs are effective in inhibiting viral DNA replication. For medical and dental teams, precaution and hygiene are extremely important to prevent self-inoculation or cross-infection (NEVILLE et al, 2016) [24].

VARICELLA-ZOSTER

VZV is highly contagious and can cause chickenpox and zoster. Its symptoms may include low-grade fever, itching, malaise, rash, and later vesicles; and are more common in children aged 6-11 but can reactivate in adults, in which it is more threatening. Skin lesions are typically preceded by oral lesions, usually painless (CLARKSON; MASHKOOR; ABDULATEEF, 2017) [8].

Healthy individuals can limit replication and recover in 2-3 weeks. After the symptoms disappear, the recoverable virus latent in the dorsal root and trigeminal nodes and can be reactivated after immunosuppression, causing herpes zoster. It generally affects sensory nerves of the trunk, head, and neck, in which dermatomes pain or paraesthesia occurs, the thoracic and lumbar nerves being most affected, followed by craniofacial. The lesions, usually unilateral and linear, ulcerate and heal in 1 to 2 weeks (NEVILLE et al, 2016) [24].

The reactivation of VZV occurs frequently in the elderly, immunodeficient patients, patients using immunosuppressive drugs, and may be associated with: lupus erythematosus, AIDS, leukemia, and lymphomas. The diagnosis of Herpes Zoster is made by clinical examination. Some laboratory tests can be used as aids in diagnosis, but most of these tests are not specific for zoster (DA SILVA FILHO et al, 2010) [10].

The second division of the trigeminal nerve is most frequently affected, and corneal involvement can lead to blindness. In 10% to 15% of these patients, post-herpetic neuralgia developed later due to central and peripheral nerve injuries (NEVILLE et al, 2016) [24].

There was a reduction in mortality, hospitalization, and complications related to chickenpox, thanks to the vaccine. However, when infected, treatment constitutes pain control, hydration, and a healthy lifestyle. Primary infections are treated with a high dose of oral acyclovir (CLARKSON; MASHKOOR; ABDULATEEF, 2017) [8].

INFECTIOUS MONONUCLEOSIS

Infectious mononucleosis (kissing disease) is transmitted due to the sharing of personal objects, kisses, and other forms of saliva exchange. Its causal agents are EBV and HHV-8 (NEVILLE et al, 2016) [24].

The EBV also causes oral hairy leukoplakia, nonspecific oral ulcers, and is related to nasopharyngeal carcinoma and a subset of lymphomas; and HHV-8 is also a critical factor in the pathogenesis of Kaposi's sarcoma (SCULLY, 2013) [18]. Both diagnoses are based on the clinical characteristics of the functions, the medical history, and the microscopic examination of a biopsy sample (BALLYRAM et al, 2016) [3].

Mononucleosis in children is usually asymptomatic. However, in young adults, prodromal symptoms (malaise, fatigue) appear 2 weeks before the development of fever, lymphadenopathy, pharyngitis, and tonsillitis, and can last from 2 to 14 days. Some of the oral lesions are: petechiae in the soft and hard palates, and necrotizing ulcerative gingivitis (NEVILLE et al, 2016) [24].

For diagnosis, the monospot test is performed. Triggering symptoms resolve spontaneously within 4 to 6 weeks, therefore, treatment is clinical symptoms only clinical (NEVILLE et al, 2016) [24].

CITOMEGALOVIRUS

The CMV descending latency in salivary gland cells, endothelium, macrophages, and lymphocytes and is therefore associated with dysfunction of the salivary gland and nonspecific oral ulcers. The transmission of the virus can happen through the passage through the placenta or infection of the newborn during delivery; it can also occur through the exchange of body fluids and blood (CLARKSON; MASHKOOR; ABDULATEEF, 2017) [8].

Most are asymptomatic, and when they show symptoms (less than 10%) are similar to flu. In rare cases, they have hepatic and nervous involvement. CMV is the most common cause of mental retardation due to viral viruses. Neonatal infections can cause diffuse enamel hypoplasia, enamel hypomaturation, friction, or dentin discoloration (NEVILLE et al, 2016) [24].

The diagnosis is clinical plus other test procedures, such as polymerase chain reaction or serological tests by immunoassays. Biopsy should be performed on chronic ulcers for immunocompromised patients who do not induce conservative therapy. Treatment is with intravenous ganciclovir, although the resolution of the majority is spontaneous. In HIV patients, treatment is an improvement in their immune status (highly active antiretroviral therapy) (NEVILLE et al, 2016) [24].

HUMAN HERPES TYPE 6 AND 7

The effect of HHV-6 and HHV-7 infections on oral mucosa is unknown. However, there is evidence that HHVs have a role in the pathogenesis of the periodontal disease. It is likely that a subclinical HHV infection may deregulate as local periodontal immune responses and interfere with normal healing and tissue remodeling (BALLYRAM et al, 2016) **[3]**.

EBOLA (EVD)

Ebola virus disease (EVD) as well as other viral diseases, for example, SARS (severe acute respiratory syndrome) and dengue, are considered to be of an emerging and reemerging character, that is, there are periods of outbreak and remission of viral infection. Diseases with character are usually common in common places, several social components. EVD caused an outbreak in West Africa in the period 2014-2015 and caused a WHO to enact a global health emergency (WHO et al, 2016) [18]. Although information about the disease was released during the 2014-2015 outbreak, the virus has been isolated since 1976 during an outbreak that occurred in Yambuku, a small village in Mongala province.

Fruit bats are likely natural hosts for the Ebola virus, which are clinically silent. The etiologic agent is transmitted to humans and non-human primates through blood and other biological fluids from infected animals or through direct contact with infected bats or fruits partially consumed by the bat. Ingestion of these contaminated fruits, as well as the raw meat of infected animals, are also modes of transmission and in Africa, outbreaks of the

disease probably start after this contact (REICHART et al., 2016) [31].

Transmission between humans occurs through contact with bodily fluids such as: blood, urine, saliva, breast milk, feces, tear secretion, and even semen, even several months after the end of clinical signs and symptoms. Health care professionals who are at greatest risk of contagion are those who dedicate direct care to EVD, such as the medical and nursing staff, as there is no transmission of the disease during the incubation period. We also draw attention to the risk of contagion of professionals who handle infected corpses, such as makeup artists and gravediggers, for example. Contagion can also be indirect, through surfaces and objects contaminated with the virus (REICHART et al., 2016) [31].

The symptoms of the disease occur after the incubation period, which lasts an average of 5-10 days and includes sudden high fever, headache, and severe weakness. Subsequently, there are symptoms such as: diarrhea, vomiting, abdominal pain, and lack of appetite. On average 5-7 days after the onset of the first symptoms, the late-stage begins with jaundice, edema, and papular rashes and some patients develop internal bleeding, greatly aggravating the patient's clinical condition, which can progress to hypovolemic shock and culminating in death (WHO et al., 2016; REICHART et al., 2016) [26,31].

Oral manifestations also appear during a late stage of viral infection, which may present as gingival bleeding and odynophagy. Nonspecific oral lesions in the oral cavity, such as whitish or reddish spots, and aphthous ulcerations can also be found (SAMARANAYAKE et al., 2015) [33]. The diagnosis of EVB is carried out through laboratory tests by detecting the virus in cell culture of infected patients, by electron microscopy, by the PCR technique (more advanced method, through the viral genome), and later by detecting infected patients. for the virus, being detected between 10-14 days after infection (REICHART et al., 2016) [31].

Until then, there is no specific medication for the disease, nor vaccines commercialized. Treatment is basically restricted to symptom control and measures to stabilize vital signs. Early assistance, with the maintenance of blood pressure, tissue oxygen supply, and electrolytes, maintaining hemodynamic balance, are essential for reducing mortality caused by the disease, which varies from 25% to 90% in Africa (WHO et al, 2016) [26].

The risk of contracting Ebola in Brazil is very low, with no confirmed cases recorded so far. However, the risk becomes a reality for health professionals who travel to provide assistance in West Africa (BRASIL, 2019) [4]. Therefore, Dentists who undergo care in areas of the outbreak for the disease, a certain group of high risk due to the mode of transmission of the disease (body fluids), which dental professionals have intimate contact with.

HUMAN IMMUNODEFICIENCY VIRUS (HIV)

There are more than 30 million people in the world with HIV and, although the rate of new ones agrees, the number of infected people continues to grow. Aiming at the effectiveness of highly active antiretroviral therapy (HAART), being HIV positive is no longer a death sentence; there was then a notable change to a chronic and largely manageable disease (JOHNSON, 2010) [16].

The body fluids responsible for HIV infection are: blood, semen, vaginal fluid, pre-ejaculatory, or breast milk. In these, HIV is present in two forms: virus-free particles and viruses infecting immune cells. Therefore, even if HIV is found in saliva, tears, and urine, the risk of infection is minimal and there is no record of cases of contamination through these secretions (JOHNSON, 2010) [16].

Biosafety procedures are designed to minimize the risk of transmission of pathogens. As for HIV, the risks of infection are associated with contaminated blood or instruments. It is important, therefore, to remember the viral load necessary for the infection to be transmitted (JOHNSON, 2010) [16].

Many of the first manifestations of immune suppression associated with HIV occur in the mouth (usually aggravated, bacterial and viral), and are therefore considered "sentinels and signs" of HIV infection (GREENSPAN, 1997) [14]. Therefore, oral health teams play a key role from early diagnosis to the treatment of diseases that affect these patients.

When assessing the oral health of this population, it is found a predominantly opportunistic fungal infection, such as Candida albicans or with viruses of the herpes family, mainly herpes simplex, herpes zoster, and Epstein-Barr. Other findings are: xerostomia associated with anti-HIV drugs, which often aggravates other issues and increased melanin deposits, which are frequent in long-standing HIV data. Effective treatment of opportunistic diseases is also closely linked to effective antiretroviral treatment (JOHNSON, 2010) [16].

Warts and papillomas can be noticed by association with human papillomavirus (HPV), even ineffective antiretroviral therapy, in addition to Kaposi's sarcoma. Rare fungal infections and bacterial burials can still occur, especially tuberculosis. There is a greater susceptibility to periodontal rupture and that of caries may be increased since these patients tend to neglect dietary care and oral hygiene. Therefore, the clinician must be attentive to the signs found in the mouth, and restorative and periodontal care need to be reinforced (JOHNSON, 2010) [16].

CONSIDERATIONS

There are several diseases, such as which health professionals are exposed to on their day of care, due to greater contact with infected people in a hospital and/or outpatient setting. Dental professionals belonging to the risk group for infectious diseases, due to their performance mainly in a very limited area, such as the mouth, making close contact with the patient necessary.

Thus, the oral health team is extremely susceptible to the contagion of diseases that have biological fluids, droplets of saliva, and blood as their main source of contagion. Such vulnerability is still exacerbated by exposure to aerosols generated by the instruments used in the service, by the high frequency of performing unhealthy activities directly, by handling contaminated sharps, and in many cases, still not taking advantage of poor biosafety practices. and neglected self-care.

Therefore, it is essential to address this issue in order to maintain good biosafety practices in dental care and to be aware of the exposure to which these professionals are disclosed, so that it can lead as clinical and hospital conducts to more enlightening and safe paths not concerning the health care of workers and the population.

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