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COVID-19: ações de biossegurança para atendimento odontológico durante a pandemia.

COVID-19: biosafety actions for dental care during a pandemic.

COVID-19: acciones de bioseguridad para el cuidado dental durante la pandemia.

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Resumo

A disseminação desenfreada do SARS-CoV-2 em todo o mundo aumenta a probabilidade de que os cirurgiões dentistas tratem esse subconjunto da população de pacientes. Devido às características da profissão e do vírus, duas situações merecem atenção: a desinfecção de superfícies que podem ser contaminadas durante o tratamento odontológico e a presença do vírus na cavidade oral e as inúmeras possibilidades de interação microbiana com microorganismos na cavidade oral. O objetivo desta revisão foi apontar, o estágio atual da discussão sobre biossegurança dental envolvendo profissionais, equipe de trabalho e pacientes, algumas medidas podem e devem ser tomadas contra a disseminação da SARS-CoV-2. A desinfecção de superfícies sempre foi primordial e o protocolo para impedir a disseminação do SARS-CoV-2 parece estar estabelecido. O SARS-CoV-2 é vulnerável à oxidação, recomenda-se o uso de um enxágue bucal contendo agentes oxidantes. Dentistas estão entre os profissionais com maior risco de infecção pelo COVID-19 e devem ter atenção extra nesse período, medidas de biossegurança devem ser reforçadas e os pacientes devem ser motivados a manter uma rotina rigorosa de higiene bucal, para que não haja acúmulo de biofilme e isso pode interferir de alguma forma com sua condição sistêmica.

Palavras-chave: COVID-19; Odontologia; Epidemia.

Abstract

The rampant spread of SARS-CoV-2 worldwide increases the likelihood that dental health care professionals will treat this subset of the patient population. Due to the characteristics of the profession and the virus, two situations deserve attention: the disinfection of surfaces that can be contaminated during dental treatment and the presence of the virus in the oral cavity and the countless possibilities of microbial interaction with microorganisms in the oral cavity. The objective of this review was to point out, the current stage of the discussion on dental biosafety involving professionals, the work team and patients, some measures can and should be taken against the spread of SARS-CoV-2. Disinfection of surfaces has always been paramount and the protocol to prevent the spread of SARS-CoV-2 seems to be established. SARS-CoV-2 is vulnerable to oxidation, it is recommended to use a mouth rinse containing oxidizing agents. Dentists are among the professionals who are most at risk of COVID-19 infection, and they must have extra attention during this period, biosafety measures must be reinforced and patients must be motivated to maintain a strict oral hygiene routine so that there is no accumulation of biofilm and this may somehow interfere with your systemic condition.

Keywords: COVID-19; Dentistry; Epidemic.

Resumen

La propagación desenfrenada del SARS-CoV-2 en todo el mundo aumenta la probabilidad de que los profesionales de la salud dental traten este subconjunto de la población de pacientes. Debido a las características de la profesión y el virus, dos situaciones merecen atención: la desinfección de superficies que pueden contaminarse durante el tratamiento dental y la presencia del virus en la cavidad oral y las innumerables posibilidades de interacción microbiana con microorganismos en la cavidad oral. . El objetivo de esta revisión fue señalar, la etapa actual de la discusión sobre bioseguridad dental que involucra a profesionales, el equipo de trabajo y pacientes, algunas medidas pueden y deben tomarse contra la propagación del SARS-CoV-2. La desinfección de las superficies siempre ha sido primordial y el protocolo para prevenir la propagación del SARS-CoV-2 parece estar establecido. El SARS-CoV-2 es vulnerable a la oxidación, se recomienda usar un enjuague bucal que contenga agentes oxidantes. Los dentistas se encuentran entre los profesionales con mayor riesgo de infección por Covid-19, y deben tener atención adicional durante este período, las medidas de bioseguridad deben reforzarse y los pacientes deben estar motivados para mantener una

estricta rutina de higiene bucal para que no haya acumulación de biofilm y esto puede interferir de alguna manera con su condición sistémica.

Palabras clave: COVID-19; Odontologia; Epidemia.

1. Introdução

Coronaviruses cause respiratory and intestinal infections in humans and animals. Most coronavirus infections in humans are caused by low pathogenic species, leading to the development of symptoms of the common cold. However, they can eventually cause serious infections, “especially” in risk groups (Gorbalenya et al., 2020).

In late December 2019, several local health facilities reported clusters of cases of pneumonia of unknown etiology that were epidemiologically linked to a seafood and wet animal wholesale market in Wuhan, Hubei Province, China. The local government of Wuhan did not immediately recognize the significance of the new SARS-like disease reported by Dr Li Wenliang and others investigators, but after some initial delay, the central government of China engaged in a rapid response that slowed down the explosion of the new disease. On December 31, 2019, the Chinese Center for Disease Control and Prevention (China CDC) dispatched a team to accompany Hubei provincial and Wuhan city health authorities and to conduct an epidemiologic and etiologic investigation (Zhu et al., 2020). It is notable that the infection appears to have been transmitted during the incubation period of the index patient, in whom the illness was brief and nonspecific (Rothe et al., 2020).

In January 2020, the World Health Organization [WHO] (2020) named the virus as severe respiratory syndrome-coronavirus-2 (SARS-COV-2), and the malady was termed “coronavirus disease 2019 (COVID-19)”. With the exponential increase in cases, the WHO declared the Chinese outbreak of COVID-19 to be a Public Health Emergency of International Concern, posing a high risk to countries with vulnerable health systems. On March 11, 2020 it was found that “more than 118,000 cases in 114 countries, and 4,291 people have lost their lives”, and then, the World Health Organization declared a pandemic by covid-19 (WHO, 2020). Globally, up to 26 April 2020, there have been 2,804,796 confirmed cases of COVID-19 (more than 84,900 new cases compared to the previous day), including 193,710 deaths (more than 6,006 new ones compared to the previous day), reported to World Health Organization (WHO, 2020).

The clinical spectrum of SARS-CoV-2 infection is very broad. However, the main signs and symptoms reported are: Fever (≥37.8ºC), cough, fatigue, dyspnea, malaise and

myalgia, upper respiratory tract symptoms and gastrointestinal symptoms (Meng et al., 2020). It is important to note that the clinical profile is not fully established, requiring further investigation and time to characterize the disease (Guan et al., 2020). Thus, clinical evaluation and treatment were established based on previously determined protocols for influenza syndrome and severe acute respiratory syndrome. The elderly and immunosuppressed people may present atypical symptoms, diseases such as hypertension, diabetes, respiratory system disease, cardiovascular diseases, and their susceptibility conditions, may be linked to the pathogenesis of COVID-19 (Yang et al., 2020).

Although most people with Covid-19 have mild or uncomplicated disease, some individuals develop severe disease that requires mechanical ventilation oxygen therapy (14%), and approximately 5% require treatment in an intensive care unit (ICU) (He, Deng, Li, 2020). Among patients who underwent chest computed tomography (CT), most showed bilateral pneumonia, with ground-glass opacity and bilateral patchy shadows being the most common patterns. Severe pneumonia is the most common diagnosis in patients with severe Covid-19 (Wang et al., 2020).

Emergency dental care was provided with advice on strict personal protection and measures to reduce and avoid production of droplets and aerosols, use of high-volume aspiration, and others, as had been recommended during the earlier SARS outbreak (CDC, 2020). While each country has adopted different approaches, at different speeds, to enacting the measures of prevention based in quarantines, all closed down routine dental care, whether private or public, in a similar way to China. In Europe, quarantines included closing dental offices for elective treatment, except in the United Kingdon. The UK National Health Service's (NHS's) initial view was that dentists and their teams should continue to provide routine care for asymptomatic patients with no close contact history and to discourage symptomatic patients from attending (Coulthard, 2020).

The objective of this review was to point out, the current stage of the discussion on dental biosafety involving professionals, the work team and patients, some measures can and should be taken against the spread of SARS-CoV-2.

One way or another, the world dental class today balances between exposing itself, exposing its patients or waiting, while remaining “understandably concerned with the financial consequences” (Coulthard, 2020b). Bearing in mind the risk relationship between the practice of Dentistry and the recent pandemic of SARS-CoV-2, this work aims to point out, through recent studies, the current stage of the discussion on dental biosafety involving

professionals, the work team and patients, some measures can and should be taken against the spread of SARS-CoV-2.

2. Metodologia

Researches are carried out with the purpose of bringing new knowledge to society, according to Pereira et al. (2018). In this study a bibliographic search was performed in the database MEDLINE (National Library of Medicine, USA - NLM), Lilacs, Scielo, Embase, Web of Science and Google Academic with the keywords COVID-19 and dental practice, dentistry, oral conditions, mouthrinses. Inclusion criteria were articles in their full and free versions. In addition to these, the World Health Organization's technical reports, Wolldld Dental Federation, American Dental Association, CDC- Center Disease control and Prevention, USA were also references.

3. Literature Review and Discussion

Direct contact (person to person) and indirect contact (contact close to less than five feet, possibility of inhaling droplets, aerosols, oral-fecal routes) are the main routes of transmission of the new coronavirus (SARS-CoV- 2), since the ocular transmission route cannot yet be ruled out, the COVID-19 disease incubation period is generally long (ranging from 2 to 14 days); however, it varies from one person to another (Peng et al., 2020; Xu et al., 2020; Lu et al., 2020). The World Health Organization (WHO) estimates the average incubation period to be 6.4 days. Asymptomatic patients and stealth carriers can transmit and infect other individuals (Shi et al., 2020).

As stated in most of the technical reports of the Medical-Dental Associations worldwide, the possible routes of transmission of nCoV-2 are mainly direct contact and droplet transmission. Aerosol transmission is also a possible route of transmission when there is exposure to high concentrations of aerosols in a relatively closed environment, such as dental offices. Routine dental procedures release aerosols, which present potential risks to the dental care team and patients (ADA, 2020). Dental teams must be attentive and maintain a healthy environment for patients and themselves. Therefore, understanding aerosol transmission and its implications for dentistry are essential. In addition to standard precautions, some special precautions it should also be implemented during this pandemic period (Ather et al., 2020).

Considering the routes of transmission, treatments and outcomes of new coronavirus (SARS-CoV-2) continually receiving much research attention recently. Dental surgeons are among the professionals who are most at risk for Covid-19 infection, and they should have extra attention in this pandemic period (Coulthard, 2020).

No study objectively assessed the risk related to dental practice, clearly due to the short time between the initial outbreak and the declared pandemic. The notes that indicate the high risk for the spread of the new coronavirus do so because of the intuitive relationship between the high viral load present in the upper airways and the possibility of exposure to biological materials promoted by the generation of aerosols during dental procedures.

Practice of dentistry involves the use of rotary dental and surgical instruments such as handpieces or ultrasonic scalers and air-water syringes. These instruments create a visible spray that contains large particle droplets of water, saliva, blood, microorganisms, and other debris, and have the potential to spread infections to dental personnel and other people in the dental office (Harrel et al., 2004; Shamszadeh et al., 2020).

As for the clinical team, a multi-disciplinary approach should be adopted in managing these patients as it allows to effectively share the expertise as well as responsibility, and treat our patients with dignity and compassion (Liang et al, 2020). It is important that oral surgeons act professionally and with compassionate non-judgemental attitudes to patients in this viral pandemic as we have learned from previous experiences such as the HIV / AIDS outbreak (Coulthard, 2020). The reviewed articles have encouraged the addition of items to the EPP commonly used in dental practice (CDC, 2020; ADA, 2020; Ather et al., 2020). In addition to gloves, surgical masks, goggles, disposable aprons and shoe protectors, it is instructed to include a disposable / reusable face shield that covers the front and sides of the face, and a particulate respirator that is at least as protective as a National Institute for Occupational Safety and Health (NIOSH) -certified N95, European Standard Filtering Face Piece 2 (EU FFP2), or equivalent, was used during emergency or routine dental care for patients without COVID-19 (CDC, 2020; Coulthard, 2020; ADA, 2020; Shamszadeh et al., 2020). When performing emergency dental treatment with suspected COVID-19 cases, a higher level of respiratory protection should be considered, such as EU FFP3 respirators conforming to European Standard 149 (EN149) (Ge et al., 2020).

The dentist must pay attention to the strict compliance with the behavioral guidelines at the dental office established by the competent authorities. Protecting yourself and the entire team and patients has become essential for maintaining everyone's health and well-being (Ather et al., 2020; Shamszadeh et al., 2020).

If saliva droplets may contain COVID-19, which remain suspended in the ambient air and descend to the various clinical surfaces, the way we are going to deal with dental biosafety will certainly change from now on, requiring more detailed and constant care in more ventilated environments. In view of this situation, and due to the characteristics of the profession and the disease, one must pay attention to the disinfection of surfaces that can be contaminated during dental treatment (Kampf et al, 2020). Contamination of frequent touch surfaces in healthcare settings are therefore a potential source of viral transmission (Zhu et al., 2020). Disinfection of surfaces has always been paramount and the protocol to prevent the spread of COVID-19 seems to be established, thoroughly cleaning environmental surfaces with water and detergent and applying commonly used hospital-level disinfectants (such as sodium hypochlorite) are effective and sufficient procedures. The typical use of bleach is at a dilution of 1: 100 of 5% sodium hypochlorite resulting in a final concentration of 0.05%. Data with coronaviruses suggest that a concentration of 0.1% is effective in 1 min. That is why it seems appropriate to recommend a dilution 1:50 of standard bleach in the coronavirus setting (Kampf et al., 2020).

Due to the high proliferation of the virus in the particles exhaled by coughing and sneezing, “every surface in the waiting room must be considered at risk”; therefore, in addition to providing adequate periodic air exchange, all surfaces, chairs, magazines, and doors that come into contact with healthcare professionals and patients must be considered potentially infected (ADA, 2020; Spagnuolo et al., 2020).

Equipment positioned in the rooms to suck up the aerosol generated by the high-speed engines and lights that promise the inactivation of the virus in the air and surfaces is being commercialized, however, in the literature consulted there has not yet been any recent investigation related exclusively to the control of COVID-19. The effective results of exhaust fans, decontamination of surfaces by UV lamps, purifiers of environments that release ozone gas, among others, have not yet been demonstrated, specifically for this virus.

Dentists seem very willing to maintain emergency care during this phase of the pandemic (Ge et la., 2020). Although there are many uncertainties about the criteria adopted for these visits, it is suggested that most of the routine dental care was not available during the epidemic, more patients were expected to seek emergency dental service when it was needed (Shamszadeh et al., 2020; Guo et al., 2020). In order to have a clarity on what constitutes an emergency condition, dentists can refer to recent American Dental Association recommendations (ADA, 2020).

Certainly, patients with active febrile and respiratory illness will most likely not

present to dental practices, but when they heal, patients should return to their normal health care routine. It was reported that dental practice should be postponed at least 1 month for convalescing patients with SARS (CDC, 2020). It is unknown yet whether the same suggestion should be recommended for patients with COVID-19 (Meng et al., 2020).

Patients who are symptomatic and / or who have COVID - 19 and need urgent dental care that cannot be delayed should be treated with clinical staff using appropriate personal protective equipment (PPE) by a service equipped to deal with them (ADA, 2020; Ather et al., 2020).

The UK countries that maintained initial guidance on maintaining normal and elective dental clinical activity guided professionals regarding the detection of the symptomatic individual, however, the fact that asymptomatic persons are potential sources of 2019-nCoV infection may warrant a reassessment of transmission dynamics of the current outbreak (Rothe et al., 2020). Due to the unique characteristics of dental procedures where a large number of droplets and aerosols could be generated, the standard protective measures in daily clinical work are not effective enough to prevent the spread of COVID-19, especially when patients are in the incubation period, are unaware they are infected, or choose to conceal their infection (Meng et al., 2020).

The presence of the virus in the oral cavity and the countless possibilities of microbial interaction guide the biosafety established in the literature for protection against Covid-19. The use of therapeutic oral biofilm rinses and / or nasal applications might be considered in preventing viral transmission via the oropharyngeal route. Some mouth rinses currently on the market have ingredients that could contribute to the reduction of the SARS-CoV-2 viral load and thus facilitate the fight against oral transmission (Carrouel et al., 2020; Li et al., 2020). Chlorhexidine as exclusive mouthrinse may not be efficient to eliminate SARS-CoV-2. Flavonoids as coronaviral chymotrypsin-like protease inhibitors have an essential function for coronaviral replication and also have additional functions for inhibition of host innate immune responses and should be useful in fighting COVID-19.

SARS-CoV-2 is vulnerable to oxidation, it is recommended to use a mouth rinse containing oxidizing agents to reduce the salivary load viral of oral microbiota, including potential SARS-CoV-2 carriage. Mouthrinses with oxidizing solutions can reduce the viral load of SARS-CoV-2 and reduce the nasopharyngeal microbiota, which tends to coat aerosol particles and droplets on the surface during coughing or sneezing (Carrouel et al.,2020).

The use of mouthwashes based on povidone-iodine (1%) and cetylpyridinium chloride (0.05% to 0.10%) or containing essential oils to effectively reduce droplets and aerosols

produced by high-speed engine spray has been indicated (Li et al., 2020)

As the possible interaction between COVID-19 and the other microorganisms present in the oral cavity is not yet known, daily oral hygiene care must be maintained by everyone, with daily brushing two to three times a day and flossing (ADA). In fact, patients contaminated and kept in hospital beds should perform daily mouthwashes with oxidizing solutions and the equipment and tubes used in ICU patients should be cleaned with chlorhexidine at least once a day (Carrouel et al., 2020).

4. Final Considerations

The widespread spread of SARS-CoV-2 worldwide increases the likelihood that dental health professionals will treat this subset of the patient population. Universal precautions are crucial to minimize the spread of this virus and its associated disease. As presented in this review, precautions are necessary that include biosafety measures for all patients, use of substances that can minimize the spread of SARS-CoV-2 is recommended.

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